The Rise of the Corporate Sector as Net Creditor: Financialisation and Functional Income Distribution in the G7 Countries

Thesis

THE RISE OF THE CORPORATE SECTOR AS NET CREDITOR: FINANCIALISATION AND FUNCTIONAL INCOME DISTRIBUTION IN THE G7 COUNTRIES

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Abstract

This thesis investigates the rise of corporate net lending in G7 countries for the period 1990-2015. This process implies that corporate savings are in excess of capital expenditure, so that, on average, firms can finance investment solely via internal funds. This novel development contrasts with the conventional assumption about the corporate sector being a net borrower. Despite the growing importance of this phenomenon, the causes that have contributed to the rise of corporate net lending are still open to debate. This thesis contributes to filling the existing gaps in the literature by examining two, so far unexplored, channels: the process of financialisation and the functional income distribution. To address these aspects, the research employs a big dataset of annual firm-level data of listed non-financial corporations from G7 countries. The empirical findings indicate that the process of financialisation and functional income distribution have played a significant role in the determination of the level of corporate net lending.

The capacity of firms to self-finance their investment also has important consequences for the economic and financial literature. In this respect, the thesis critically discusses the measure of External Financial Dependency. This measure is meant to reflect structural and technological characteristics of the industries that are assumed not to change over time and across countries. Despite the wide use of this concept in the economic and financial literature, there is little discussion about its theoretical foundations. This dissertation fills this gap, analysing the possible determinants of external financial dependency. It argues that the standard formulation of external financial dependency can be considered a proxy of corporate net lending that can fluctuate. This implies that the standard measure of external financial dependency does not uniquely reflect structural and unmodifiable technological features of the industries. Furthermore, after extending the original calculations to G7 countries covering a period of 35 years (1980-2015), the thesis demonstrates that the assumptions of stability over time and across countries find little empirical support.

…E pensi che ambiente ne può venir fuori,

non c'è più morale contessa…

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CHAPTER 1. Introduction

In the last three decades the corporate sector has shifted from being a net borrower to being a net lender. Corporate net lending (net borrowing) is defined as the difference between corporate savings and capital investment. When this difference is negative the corporate sector is net borrower, while if the difference is positive it is a net lender.

This quite new scenario has attracted the attention among academics, media, and policy makers. *The Economist* (2016) talked about "The wrong kind of Savings" and wondered why investment did not keep pace with mounting savings. Similarly, Davidson, in *The New York Times* (2016), described this state as "unparalleled in economic history […] [. W]e don't even have much data to compare it with, because corporations have traditionally been borrowers, not savers".

Occasionally, corporate net lending has been identified under different labels. In media and academic studies it is also referred to as the "corporate saving glut" (The Economist, 2005; Gruber and Kamin, 2015), "corporate net savings" (Loeys *et al.*, 2005), "corporate surpluses" (Wolf, 2015), or "saving gap" (Galizia and Steinberger, 2003; Galizia, 2004). Irrespective of the label employed, the underlying discussion has to do with the rise in corporate savings compared to capital accumulation. In developed countries, the rise of net lending is a consequence of the faster increase in corporate savings compared to corporate investment. This mismatch has been accentuated to such an extent that the former exceeded the latter.

Sometimes, corporate net lending is also associated with the "global saving glut". This term has been introduced by the former Chair of the Federal Reserve Bernanke (2005) who, on the occasion of the Homer Jones Memorial Lecture, entitled his talk "The Global Saving Glut and the U.S. Current Account Deficit". Corporate net lending and Bernanke's discussion of the *saving glut* may seem, at first sight, synonyms. However, in his speech Bernanke was mainly referring to the large current account surpluses in developing countries that provided the liquidity needed to finance the current account deficit in the US. The saving glut he was talking about originated in third countries (mostly Asian) and was drawn to the US through the acquisition of American debt. It is undeniable that current account surpluses in developing countries can largely correspond to excess savings of exporting firms in third countries. Nevertheless, this argument tends to overlook the domestic situation of each institutional sector in developed countries. In fact, especially in the new century, the

corporate sector of most G7 countries has been accumulating large amount of savings. As Cardarelli and Ueda put it:

> The large current account surplus in emerging market […] countries has been labelled a global 'savings glut' […]. Yet, the $1.3 trillion of corporate excess saving (undistributed profits less capital spending) in the Group of Seven (G7) countries in 2003–04 was more than twice the size of the accumulated current account surpluses of emerging market and developing countries during those two years (Cardarelli and Ueda, 2006, p. 135).

This perspective is held also by other authors. Commenting on the notion of Global Saving Glut and the idea that Asians and Europeans save too much, Wessel in the *Wall Street Journal* maintained that:

> there is more to this story [i.e. the global saving glut]: Companies, which normally borrow other folks' savings in order to invest, have turned thrifty. Even companies enjoying strong profits and cash flow are building cash hoards, reducing debt and buying back their own shares - instead of making investment bets (Wessel, 2005).

A J.P. Morgan report is also very explicit on this point:

> *The real drivers* of this saving glut in recent years has been *the corporate sector*. Between 2000 and 2004, the switch from corporate dis-saving to net saving across the G6 economies amounted to over $1 trillion. Increased saving by emerging economies has played an important role, but over the past four years the increase in G6 corporate saving has been about five times greater (Loeys *et al.*, 2005; our emphasis).

Finally, *The Economist* (2005) argued that "[c]ompanies, *not emerging economies*, are leading the global shift to thrift" (our emphasis). This shift has involved most developed countries' corporate sectors, with the only exception of France (Wolf, 2015). In summary, there are two points to highlight which are relevant for this study. First, corporate net lending is a sizable and unparalleled phenomenon that constitutes a topic of interest, independently from Bernanke's argument on the Global Saving Glut. Corporate net lending is not necessarily related to the polarised worldview of Bernanke, according to which foreign savings finance the current account deficit. Second, corporate net lending is not exclusive to American firms, but it is a generalised trend that affects most developed nations.

1.1. Motivation for research

The growth of corporate net lending raises different aspects of attention. First, it represents a shift in the traditional role of the corporate sector as a net borrower to being a net provider of funds to the rest of the economy (De Souza and Epstein, 2014). Importantly, this change reflects a modification in the net financial needs of the corporate sector. The rise in net lending is the result of a mismatch between the potential of firms to self-fund their investment (represented by the increasing savings) and the actual materialisation of capital accumulation to channel their investment (that is stagnant or growing at a slower pace). This implies that the corporate sector accumulates a latent source of internal funds that is not employed to foster real investment and economic growth.

Given the generalised increase that affects most of developed countries, our area of inquiry will focus on the evolution of corporate net lending in the group of most developed countries, i.e. G7 countries. There is burgeoning number of studies that explore different causes behind the rise in corporate net lending in developed countries. The existing academic literature has explored net corporate lending in relation to different causes, such as economic volatility, uncertainty and financial constraints (Brufman, Martinez and Pérez Artica, 2013), deleveraging (Cardarelli and Ueda, 2006; Saibene, 2018), internationalisation of production (Cesaroni, De Bonis and Infante, 2017) and profitability (André *et al.*, 2007; Dao and Maggi, 2018). Despite the growing attention to the topic, some of the hypotheses considered by the existing literature find little or no empirical confirmation. Hence, the discussion around the causes of the rise of net lending is still open.

In order to study the factors that have contributed to the rise in net lending, the research will focus on two explanatory factors, the process of financialisation and functional income distribution. Despite there being a rich literature dedicated to these two drivers, they are still largely unexplored in studies on net lending.

Financialisation is considered to have had a big impact on contemporary economies. This process has brought quantitative change (i.e. the growth of the financial sector and volume of operations) as well as qualitative modifications (e.g. the creation of new financial products, the modification in the organisation of firms and households) in a wide range of economic spheres (see van der Zwan, 2014). Among other aspects, several authors have highlighted how this process affects the logic of accumulation of the corporate sector (Lazonick and O'Sullivan, 2000), contributes to the rise of financial payouts (Crotty, 2005), and depresses investment (e.g. Orhangazi, 2008). These modifications, it will be argued, contributed to generating mechanisms that have fuelled the rise in corporate net lending.

The second aspect explored is functional (or factor) income distribution. Even though functional income distribution has been absent for a long time from the economic research agenda, in recent times there is a renewed interest in this topic (Atkinson, 2009). Nowadays, it is widely recognised that most developed countries witnessed a marked decline in the wage share over the last forty years (Hutchinson and Persyn, 2012; Elsby, Hobijn and Şahin, 2013). This shift has induced the proliferation of studies on the topic, trying to assess the causes of the changes of the factors shares and its impact on different economic aspects, such as economic growth (Houngbonon and Da Costa, 2017), current account (Behringer and van Treeck, 2018) and inequality (Francese and Mulas-Granados, 2015). More importantly from our perspective, the declining wage share is associated with the increase in profits (Barkai, 2016) that, it will be argued, constitutes an important channel for modelling the impact on corporate savings and hence on net lending.

Interest in this topic is not limited to the determination of the causes behind the rise of net lending, but it also involves a more fundamental level of analysis, especially with respect to the implications for other streams of economic and financial literature. As mentioned above, the emergence of net lending implied that the corporate sector became a net provider of funds to the wider economy. Contrary to this situation, a net borrowing corporate sector indicates that savings are not sufficient to cover investment, so that the corporate sector needs to borrow from other institutional sectors. Consequently, corporate net lending can be considered a measure of external financial exposure of the corporate sector. Net lending is not the only measure that has been developed in the economic and financial literature. In a well-known paper, Rajan and Zingales (1998) developed a measure that is designed to be able to capture the external needs of the firm. This is the External Financial Dependence (EFD) index which, according to its original formulation, relates the cash flow generated by companies with their investment in fixed assets. The intuition behind this index is that industries' dependence on external funding varies depending on structural technological features. According to this principle, the authors estimate a value of EFD in each manufacturing industry. Another crucial aspect that characterises this measure is that the EFD index lies on two fundamental assumptions, namely that the EFD industry values do not change considerably across time and between countries. Following these assumptions, Rajan and Zingales (1998) compute an EFD index using values for American firms during the 1980s and argue that these estimates are a valid proxy of EFD of the corporate sector in other countries and periods.

The thesis enlarges its focus beyond the sole discussion on the causes of net lending, by considering the EFD index developed by Rajan and Zingales. There are different aspects that justify this attention. Similar to corporate net lending, the EFD index is a measure that is meant to grasp the financial exposure of the corporate sector to external sources of finance. However, despite the similarity of the concepts of net lending and EFD, there is no debate in the literature that compares these two measures. The interest towards this measure is further justified by its popularity among finance and economics research. Even though the index is used in numerous studies, most of the relevant literature employs it without considering the theoretical assumptions in their empirical analysis.

1.2. Objectives of the research and research questions

There are two general issues of the research that emerge from this discussion. Primarily, the objective is to shed light on the evolution of corporate net lending among listed non-financial corporations (NFC) in G7 countries (i.e. US, UK, Germany, Italy, France, Japan, Canada) and to discuss the possible causes of this evolution between 1990 and 2015. Furthermore, the research aims at exploring the possible links between corporate net lending and the External Financial Dependence (EFD) index.

From this general starting point, it is possible to delineate four specific objectives and associate each of them with specific research questions.

- *Objective 1*: Describe and characterise the evolution of net lending among listed NFC of G7 countries between 1990 and 2015.

In relation to this objective, the following research question will be addressed:

- How did the level of net borrowing/net lending evolve among listed NFC of G7 countries between 1990 and 2015?

- *Objective 2*: Evaluate the role of the process of financialisation and functional income distribution in the determination of the level of corporate net lending.

With respect to *objective 2*, the following research questions will be answered:

- What is the role played by financialisation in the determination of the level of corporate net lending?
- What is the role played by functional income distribution in the determination of the level of net lending?

- *Objective 3*: Analyse the similarities and differences between the measure of corporate net lending and EFD normally employed in the literature.

In relation to this objective, the following research question will be addressed:

- To what extent the measures of net lending and the EFD are theoretically *and* empirically different?

- *Objective 4*: Examine the assumptions of stability of the EFD index in time and across countries.

With respect to objective, the following research question will be answered:

- In light the analysis of net lending, to what extent the assumptions of stability in time and across countries, employed by Rajan and Zingales (1998) in the construction of their EFD index, are valid?

1.3. Contribution of the research

In order to address these research questions, the analysis is based on a large dataset of listed NFC among G7 countries (the US, UK, Germany, Italy, France, Japan and Canada). Even though the final database employed constitutes a subset of the whole corporate sector it represents a valuable source of information, for two main reasons. First, some studies show that listed firms have a higher propensity to be net lender than the whole corporate sector (Galizia and Steinberger, 2003). This implies that the focus on listed firms allows to capture some of the main drivers of corporate net lending. Second, firm-level analysis also permits a detailed analysis of the trends and characteristics of the sample, as it allows a more comprehensive analysis of net lending in relation to firm characteristics than aggregate studies (i.e. based on the whole corporate sector) can provide. Data are obtained from the Worldscope database. This database provides balance sheet information for all listed companies around the world and it is widely employed in firm-level studies (e.g. Kroszner et al., 2007; Beck et al., 2008; Eije and Megginson, 2008).The final dataset employed in the analysis consists of more than 23,000 different companies.

Under *objective 1*, the thesis contributes to the literature on corporate net lending by providing evidence of the evolution of corporate net borrowing/net lending among the sample of firms and countries. This is important as it will offer a detailed analysis of the country specific trend of net lending in listed NFC. Moreover, descriptive figures of corporate net lending in relation to other characteristics of the firms, such as size, geographical location and payout status will be provided. This information adds to the existing evidence on the evolution of corporate net lending in developed countries (e.g.

André et al., 2007; Cardarelli and Ueda, 2006; Dao and Maggi, 2018; Galizia, 2004) that usually focuses on shorter periods and/or fewer countries.

With respect to *objective 2*, this research contributes to the literature on the determinants of corporate net lending by exploring two channels. As to the first one, it evaluates the role played by the process of financialisation and financial payouts. This is the first attempt to consider financialisation as a possible factor contributing to the rise of corporate net lending. By exploring this factor, not only does the research provide an innovative contribution to understanding the rise of corporate net lending, it also contributes to the literature on financialisation by showing the effects of this process on a phenomenon (net lending) that has not yet been considered by this stream of literature. The second channel explored deals with the role of functional income distribution and the possible impact on corporate net lending. This extends the scope of existing analysis on profitability and net lending by focusing on the role of functional income distribution, broadly defined as the distribution of income between wages and profits (Glyn, 2011, p. 101). To the best of our knowledge, there are no other studies that explore at the possible impacts of functional income distribution on corporate net lending at the firm-level.

Furthermore, the study provides a detailed analysis of the EFD index. In particular, the analysis links the discussion on the emergence of corporate net lending with the EFD index (*objective 3*). The theoretical definitions and empirical underpinnings of the estimation of the two indicators will be explored. Despite the similarities between the EFD index and corporate net lending, the two measures embody very different types of analysis. While it is accepted that net lending evolves in time, the EFD index is usually assumed to be a steady measure. It is therefore necessary to disentangle these aspects and assess possible points of contact between the two indicators (EFD index and net lending). Once established that the EFD index is a proxy of net lending, it can be argued that the aspects that influence the evolution of net lending also impact on the EFD index, so that it is not possible to claim that the EFD index reflects exclusively structural technological features of the industry. This exercise is particularly relevant as it connects two streams of literature that have always been independent from each other.

To test the assumptions of stability of the index in time and across countries (*objective 4*) the study estimates the industry values of the EFD index for NFC extending the period of analysis (1980 and 2015) and the geographical coverage (the G7 countries). This is the first study to reproduce the EFD index for so many countries and across different periods. In addition, there is a critical assessment of the EFD index developed by Rajan and Zingales

and an evaluation of its relevance in light of the rise in net lending. This analysis will provide useful insights to the literature that employ the EFD index that accepts that the assumptions of stability of the index holds.

1.4. Structure of the dissertation

Chapter 2 provides a review of the literature to which the research contribute. Section 2.2 presents evidence relating to the evolution of corporate net lending among G7 countries at the aggregate level. The aim of this section is to show the magnitude of the phenomenon and its relevance for economic analysis. Section 2.3 discusses the existing literature on corporate net lending, presenting the hypotheses explored, the main methodology followed and identifying gaps in the literature. This is necessary to build the contribution of the research and assess the alternative causes that have impacted on the level of net lending. These are presented in Section 2.4, that focuses on financialisation and functional income distribution, and delineates the theoretical mechanisms through which these factors may have contributed to the rise of corporate net lending. Section 2.5 discusses the EFD index in relation to corporate net lending. It describes the original construction of the measure, giving particular attention to the assumptions behind its construction, their relevance to the financial and economics literature. Afterwards, it critically assesses the EFD index by relating it to the rise on corporate net lending.

Chapter 3 deals with the methodological aspects of the dissertation. First, it presents the econometric approach followed to test the research *objective 2* (Section 3.2). Subsequently, the chapter describes the dataset employed for the empirical analysis (Section 3.3). Here, different important issues regarding data availability and the process of data cleaning are discussed.

The findings on *objectives 1* and *2* are presented in Chapters 4 and 5. Chapter 4 presents descriptive statistics relating to net lending, that is functional to assess *objective 1*. This analysis allows the evolution of net lending to be characterised, addressing country specificities, exploring the link with other characteristics of the firms (e.g. size); together with an exploration of financial payouts and functional income distribution. The role played by these two factors is further tested in Chapter 5, where different versions of the econometric model presented in Chapter 3 are implemented.

Chapter 6 is dedicated to the discussion of the concept of EFD in relation to the emergence of corporate net lending. This analysis involves different dimensions. Drawing from the discussion presented in the literature review, the chapter discusses the theoretical definition

and empirical estimation of EFD in relation to that of corporate net lending (*objective 3*). It is showed that the components of the two measures are very similar, on definitional and empirical grounds. This leads to a conclusion that the EFD index can be considered a proxy of corporate net lending. The analysis of the concept of EFD continues by analysing the assumptions of stability of the index over time and space, consistent with research *objective 4*. To do so, we re-estimate the EFD index extending the period of calculation for the G7 countries over 35 years (1980-2015). The tests performed in this chapter employing the new estimations of the EFD index reveal that the two assumptions find little empirical support.

In the concluding Chapter 7, the findings of this dissertation are combined and discussed in relation to the research objectives detailed above, together with the limitations of the research. This chapter also includes a summary of the contributions of the thesis, and a discussion of the relevance of findings for the existing literature and economic policy, together with a consideration of possible future areas of inquiry.

Table 1. Structure of the Dissertation.

Identification of research gaps	Chapter 1. Introduction	- Relevance and motivation of the thesis. - Objectives and research questions. - Contribution of the research
	Chapter 2. Literature Review	- Overview of the evolution of corporate net lending among G7 countries. - Existing literature on net lending and gaps. - Alternative explanations: financialisation and functional income distribution. - Net lending and its connection with measures of external financial dependency. - Critical assessment of the External Financial Dependency index.
Methodology	Chapter 3. Methodology	- Econometric approach. - Description of the variables. - Data collection and data cleaning.
Analysis and Discussion of Findings	Chapter 4. Descriptive Analysis and Stylised Facts	- Evidence of the evolution of corporate net lending among listed NFC. - Characterisation of corporate net lending. - Financial payouts, evolution and corporate net lending. - Functional income distribution and corporate net lending.
	Chapter 5. The Rise of Net Lending among NFC (1990-2015): Econometric Analysis	- Econometric results: • Full sample • Sub-period analysis • Country analysis • Robustness tests
	Chapter 6. From net lending to financial dependency: a critical appraisal of the external financial dependency index.	- Theoretical comparison between the EFD index and corporate net lending. - Reproduction of the EFD index. - Test of hypotheses of stability in time and space. - Empirical comparison between EFD and net lending.
Conclusions	Chapter 7. Conclusions	- Contributions to knowledge. - Limitation of the research. - Future research.

CHAPTER 2. Literature Review

2.1. Introduction

This chapter assesses the relevant literature for this research. First, it aims to describe the recent rise of corporate net lending among G7 countries and deals with some implications for economic analysis. Second, it presents the existing literature on net lending by reviewing the main causes taken into consideration and highlighting some of the gaps that this research contributes to fill. Once the existing gaps are delineated, two alternative causes that can contribute to net lending, financialisation and income distribution, are discussed. Finally, the chapter discusses in detail the relation of corporate net lending with the External Financial Dependence (EFD) index formulated by Rajan and Zingales (1998), providing a critical assessment of the index based on the discussion on net lending.

The chapter is organised as follows. Section 2.2 provides an overview of the rise of aggregate corporate net lending among G7 countries from 1990 to 2015, that is the period during which net lending increased in most of G7 countries. It is shown that corporate net lending is the result of the combination of the increase in savings and the stagnation of capital accumulation.

Section 2.3 critically assesses the existing literature on the causes behind the rise of corporate net lending. What emerges from this overview is that there is little evidence in support of the hypotheses considered so far and that there is space to explore further factors that can impact on net lending. Section 2.4 addresses the possible role occupied by two alternative factors, the process of financialisation and income distribution, in the rise of corporate net lending. For this reason, we review the literature on financialisation and functional income distribution and detail how these two factors might have a significant role to play in the analysis.

The observation that corporations have become net providers of funds to the rest of the economy has important consequences to the analysis of external financial needs of the firms. Section 2.5 shows that corporate net lending is not the only indicator employed in the literature that relates a measure of internal funds of the firms to capital expenditure. In particular, the section focuses on the EFD index developed by Rajan and Zingales (1998) to capture the industries' dependence on external finance. According to Rajan and Zingales, the EFD index is meant to reflect structural features of the industries, determined by their technology. Notably, the authors (and the literature related to the EFD index) assume that these values are steady, so that they do not change in time and across countries. This position

contrasts with the rise of net lending, which varies in time and across countries. In order to explore these contradictory aspects, the discussion on the EFD index is organised into three subsections. First, the construction of the EFD index is described together with the main assumptions behind this measure. Then, the importance of the EFD index is highlighted by critically reviewing the literature that employs it and presenting the main attempts to replicate the index. Finally, we critically assess the EFD index, in particular with respect to its assumptions of stability and in relation to the emergence of corporate net lending. It is argued that the assumptions are too restrictive and that the concepts of EFD and net lending are closer than usually believed by the literature.

Section 2.6 resumes the main aspects of this chapter and outlines the main contributions that will be developed in the following ones.

2.2. The rise of net lending among G7 countries

2.2.1. Definition and stylised facts

To provide an accurate definition of corporate net lending it is necessary to refer to the System of National Accounts (UN, 2009) and, in particular to the subsection on the Sequence of Accounts. The Sequence of Accounts "records flows and stocks in an ordered set of accounts describing the economic cycle from production and the generation of income, through its distribution and redistribution, and its use for final consumption." (EUROSTAT, 2013, p. 193). According to this framework, the economy is divided into different accounts, each one considering different spheres of economic activity, from the production to the revaluation account. Each account departs from an aggregate measure and discounts different items from it. The residual of each account is the "balancing item". Given the sequential structure of this framework, the balancing item deriving from one account is carried forward and represents the starting point of the subsequent account. The balancing item can be conceived as the residual deriving from the subtraction of quantifiable macroeconomic aggregates in each account and it "cannot be measured independently of the entries in the accounts" (UN, 2009, pp. 38–39).

There are five domestic institutional sectors in the sequence of accounts: (i) non-financial corporations, (ii) financial corporations, (iii) households, (iv) general government, and (v) non-profits institutions. For each institutional sector:

> net lending is the balancing item of the capital account and it is defined as the difference between changes in net worth due to saving and capital transfers and net acquisitions of non-financial assets […]. It shows the amount of the resources

remaining for purposes of lending or that need to be borrowed (UN, 2009, p. 198).

The fact that net lending is obtained as a balancing item from the capital account implies that it cannot be obtained independently from the measurement of savings and capital expenditure. For the whole economy, net lending/net borrowing is equal to the sum of each institutional sector's net lending/net borrowing. This measures represents the "resources that the total economy makes available to the rest of the world (if it is positive) or receive from the rest of the world (if it is negative)" (EUROSTAT, 2013, p. 274).

With respect to the corporate sector, net lending/net borrowing is defined as corporate savings minus acquisition of non-financial investment. Corporate savings is equal to net disposable income (UN, 2009, p. 182) while the investment corresponds to fixed capital expenditure. If corporate savings exceeds fixed capital expenditure the corporate sector is considered net lender, otherwise it is net borrower.[1] In the latter case NFC will be net receiver of funds from the rest of the economy (or the rest of the world). When the corporate sector is net lender there is a net amount of resources that are made available to other institutional sectors. Before presenting figures about the evolution of corporate net lending, it is worth mentioning that some private businesses (namely, some unincorporated businesses, mostly corresponding to small enterprises) are accounted for within the household sector, and not within the corporate sector. This aspect was highlighted by Steindl(1982) , who acknowledged the difficulty associated to the differentiation between "genuine" households from unincorporated businesses. This is an aspect to keep in mind, when observing data concerning the NFC sector. The fact that corporate net lending is increasing among NFC, does not provide information about unincorporated businesses, that are still widely debt-financed. As it will be evident in the ongoing analysis (in particular, Chapter 4), there is a high degree of heterogeneity between firms, which indicates that, despite the aggregate growth of net lending, a consistent number of firms are still net borrowers.

Table 2 shows the evolution of the aggregate corporate net lending from 1990 to 2015 in G7 countries. During this period there was a generalised increase in net lending, particularly during the twenty first century. Between 1990 and 2001, NFC were markedly net borrowers in the US, the UK and Germany, while the corporate sector was predominantly a net lender only in France, Japan and, to a lesser extent, Canada. Italy had an intermediate situation,

[1] For the sake of simplicity, the foregoing analysis will mostly refer to net lending only. Negative net lending values will represent a net borrowing condition.

oscillating between (mild) net borrower status and (mild) net lender status. After 2001 this situation reverses, and the NFC sector became net lender in all G7 countries, with the exception of France in particular years. The increase recorded after the dot-com crisis is interrupted only during the Global Financial Crisis of 2007-2008, when the corporate sector became net borrower, mostly because of the sharp decline in corporate savings that was more accentuated than the decline in capital expenditure. This shift, however, was short lived. Since 2009 the corporate sector became a net lender in all countries of the sample, with France as the only exception. Despite these fluctuations, it can be concluded that there has been an overall increase in net lending during the 2000s compared to the previous sub-period (1990-2001). As shown in Table 2, the average net borrowing/net lending for the corporate sector of the G7 countries between 1990 and 2001 was -0.09% of GDP while between 2002 and 2015 it was 2.1% of GDP.

Table 2. NFC Net Lending/Net Borrowing as % of GDP.

year	USA	UK	DE	IT	FR	JP	CN
1990	-1.3	n.a.	n.a.	n.a.	-1.1	n.a.	-0.8
1991	0.1	n.a.	n.a.	n.a.	-1.1	n.a.	-0.3
1992	-0.2	n.a.	n.a.	n.a.	0.7	n.a.	0.3
1993	-0.5	n.a.	n.a.	n.a.	2.7	n.a.	1.2
1994	-0.6	n.a.	n.a.	n.a.	1.8	1.6	2.3
1995	-0.5	-1.9	5.1	0.2	1.5	-1.0	2.6
1996	-0.4	-2.2	-0.4	0.6	1.5	1.6	2.8
1997	-1.0	-2.5	-0.8	-0.5	2.0	0.1	0.2
1998	-2.0	-3.3	-1.6	0.8	1.1	5.5	-0.8
1999	-2.0	-4.4	-3.1	-0.7	0.3	3.2	-0.2
2000	-3.0	-5.3	-5.9	0.3	-0.9	4.4	1.2
2001	-0.8	-5.1	-1.8	0.4	-1.0	3.5	3.4
2002	1.2	-1.8	1.1	-0.8	-0.1	8.4	4.8
2003	1.7	1.1	0.2	0.4	0.5	7.6	5.2
2004	1.3	2.2	2.3	0.1	0.6	8.2	5.1
2005	1.2	2.9	1.7	0.6	0.3	6.9	4.6
2006	0.4	1.6	1.7	-0.2	-0.7	5.9	3.1
2007	-0.9	1.2	1.2	-1.7	-1.2	5.6	3.2
2008	-0.5	2.2	0.3	-2.2	-0.9	4.4	3.7
2009	5.0	4.3	2.9	1.3	1.0	7.6	2.5
2010	4.6	2.3	4.3	0.3	0.9	9.8	3.2
2011	3.6	3.2	2.3	0.1	-1.0	6.2	2.7
2012	2.2	2.5	2.2	2.7	-1.8	7.3	0.8
2013	1.6	1.1	2.1	2.2	-1.9	8.0	0.8
2014	1.1	0.9	2.4	2.9	-2.5	5.6	0.2
2015	0.4	0.1	2.7	2.3	-1.7	5.4	-0.9

Note: Positive values denote net lending, while negative values net borrowing.
Source: OECD, available at: https://data.oecd.org/natincome/net-lending-borrowing-by-sector.htm

Bernanke and Gertler (1989, 1990) show that business upturn can improve net worth and investment of firms. Drawing from this argument, it could be contended that part of the rise in net lending could correspond to cyclical fluctuations of the economy. In fact, as can be observed in Table 2, and because of the decline in the level of net lending during the Global Financial Crisis, there is a cyclical component to this variable. However, the relationship between net lending and economic performance is not always linear. While net lending is usually on the rise in periods of fast growth such as at the beginning of the 2000s, corporate net lending is persistent also in years of low growth, such as in Italy after the Global Financial Crisis; and net borrowing is present during periods of strong GDP expansion, such as at the end of the 1990s.

The rise of net lending can also be interpreted as a mismatch between the growth savings in comparison to investment. This mismatch can be the result of (1) a rapid increase of corporate saving compared to investment, (2) a decrease in the rate of accumulation and constant savings rate or (3) the simultaneous increase in savings accompanied by the slowdown of accumulation. Generally, the emergence of net lending recorded in Table 2 is the combined outcome of the rise of savings *and* the reduction in the investment rate. This divergence is widely documented and it is persistent since the end of the 1990s. Galizia and Steinberger (2003) and Galizia (2004) were among the first scholars that focused on the increasing gap between corporate savings and capital expenditure for a pool of European countries (Germany, France, Italy, Spain, UK). The authors highlight that this trend is due to the combination of the decline of corporate investment and an increase in corporate savings. As a consequence of the erosion of the gap between savings and investment, internal funds have been increasing as a source of funds for the private sector compared with external sources (Galizia and Steinberger, 2003, p. 1). The widening trend between corporate savings and corporate investment is documented also in more recent studies. Chen et al. (2017) show that global corporate savings have increased from 10% to 15% between 1980 and 2015.[2]

At the same time, the accumulation of capital slowed down in all developed countries. For example, American NFC approximately halved their rate of physical investment between the 1970s and the 2000s (Orhangazi, 2008a, fig. 1). This tendency is also reflected in the ratio of investment over profit which among developed countries diminished considerably in the last three decades of the 20th century (Stockhammer, 2006, fig. 1; Durand and Gueuder,

[2] This movement was mirrored by the decrease in households' savings as share of global GDP that fell from 15% to 8% (Chen, Karabarbounis and Neiman, 2017).

2018). The overall picture is re-affirmed by Dao and Maggi (2018) who show that "firms have not been using these saving to finance greater capital expenditures [and that] in all countries, the shift of corporations to net lenders has been driven by a combination of both a rise in gross saving and a fall in capital expenditure" (Dao and Maggi, 2018, p. 10).

2.2.2. The shift from net borrower to net lender: implications for economic analysis

The rise in net lending has relevant implications for economic analysis. The most evident and immediate aspect to acknowledge is that with the shift from net borrower to net lender the corporate sector has become a net provider of funds to the economy which contrasts with the standard assumptions of the corporate sector as net borrower (De Souza and Epstein, 2014).

Economic theory considers that the corporate sector structurally relies on external funds to finance its productive investment. The orthodox[3] literature rooted in the loanable fund theory (Ohlin, 1937) assumes that households' savings are essential to finance corporate investment. According to the standard textbook narrative, commercial banks channel households' savings to the corporate sector that borrows it to invest. Within this framework, households savings are a necessary condition for bank lending. The corollary of this standard model is that households are net lenders to the corporate sector, which is net borrower.

In recent years, the causal link, from savings to investment, has been object of controversy even amongst mainstream authors. It is now widely accepted that commercial banks can create money via loans irrespectively of the amount of household savings they *previously* collected. This is stated clearly by McLeay et al. (2014)from the Bank of England who maintain that:

> the majority of money in the modern economy is created by commercial banks making loans. Money creation in practice differs from some popular misconceptions - *banks do not act simply as intermediaries, lending out deposits that savers place with them*, and nor do they 'multiply up' central bank money to create new loans and deposits (Mcleay et al., 2014, p. 1; our emphasis).

[3] Within this research, "orthodox" or "mainstream" economics will also be "referred to as neoclassical economics, marginalism, the dominant paradigm or mainstream economics" (Lavoie, 2014, p. 5). Although not all authors view these terms as synonyms (e.g. Colander, 2000), for present purposes we use these terms interchangeably (on this see Lavoie's (2014, pp. 5–6) contribution).

The loanable funds theory is challenged also from non-mainstream schools of thought, in particular by post-Keynesian authors (e.g. Moore, 1988; Lavoie, 1997; Rochon, 1999; Fontana, 2003; Park, 2004) and others with a Marxist background (e.g. Bellofiore, 2014). Economists belonging to non-orthodox traditions have maintained for long (see the works of Kalecki, 1954; Kaldor, 1970; Robinson, 1970) that the quantity theory of money does not explain the creation of money supply by central banks and that loans to the corporate sector are created autonomously by commercial banks, regardless of the amount of savings previously provided by the household sector.

What is important to highlight here is that, independently from the theory of money creation, all the different streams mentioned in this subsection place external financing (whether through bank loans or equity issuing) at the core of the strategy to finance corporate investment. Consistent with the idea that the corporate sector needs to borrow money from the banking system and, more generally, from financial markets, the corporate sector is normally supposed to be a net borrower (Gruber and Kamin, 2015; Cesaroni, De Bonis and Infante, 2017). The reversal of this situation has implied a new context in which the corporate sector is a net provider of funds to the rest of the economy, something of a novelty for economic theory.

Some non-mainstream authors have stressed the role played by corporate savings has in funding corporate investment. Toporowski (2009, 2012) and Levy-Orlik (2010) recall the works of Kalecki (1954) and Steindl (1989) who argue that most of private investment is financed mainly via retained profits. Toporowski (2000, p. 25) asserts that fixed capital in developed countries is financed mainly via internal funds. In this sense, the importance of internal funds in funding capital expenditure is not a novelty as testified by these contributions that stress the role of internal finance in financing investment. What the rise of net lending indicates is a deepening of this phenomenon. A net lending corporate sector indicates not only that *most* investment can be financed via corporate savings at the aggregate level, but that virtually investment for the *whole* corporate sector can be funded via internal funds.

It is worth stressing that even though the corporate sector has become a net lender it is not possible to conclude that *all* firms do not need external funding. Aggregate figures do not allow an appreciation of the variety of cases that can be found within the corporate sector of a country. As will be shown in the ensuing chapters, distinguishing between types of firms is essential as aggregate figures can hide the vast heterogeneity of the corporate sector. At the same time, these changes in net lending do not imply that banks stopped providing credit

lines to the corporate sector. Net lending is a measure of the capacity of firms to finance their investment using their savings, but it does not imply that firms do not increase or incur new liabilities. The emergence of net lending puts the corporate sector in a new light, as it became a net provider of funds to the rest of the economy instead of net demander.

In addition to these aspects, the rise of net lending has important consequences with respect to other contributions in economics and corporate finance. As mentioned, net lending is equal to the difference between corporate savings and their expenditure in fixed capital. In other words, it relates a measure for generating internal funds (savings) to the expenditure needed to acquire fixed assets. This means that corporate net lending is, ultimately, an indicator of the financing position of a certain economic actor, in this case the corporate sector. This, however, is not the only measure that tries to grasp the external economic needs of the corporate sector.

In an important contribution, Rajan and Zingales (1998) developed the so-called External Financial Dependence (EFD) index. The aim of this indicator is to create a synthetic measure capable of capturing the external financial needs of the corporate sector that are needed to cover its capital expenditure. The EFD index relates the cash flow generated by the firm to its capital expenditure. When the internal funds generated by the firm (cash flow) are insufficient to cover capital expenditure, an external source of funding is required to finance investment in fixed assets. Conversely, if the cash flow is higher than capital expenditure the firm is virtually financially independent, since it internally generates the liquidity needed to fund its investment.

The original Rajan and Zingales approach assigns a value of the EFD index to each manufacturing industry. Industry values of the EFD index are obtained by employing data for listed American firms during the 1980s. Each industry is ranked according to its financial needs, from the least to the most financially dependent industry. According to the authors the main determinant of the level of the EFD index is technological. Some industries will be structurally more dependent on external funding than others, given the capital needs involved in each productive process. Moreover, the EFD values obtained from listed American firms during the 1980s are supposed to be a representative and universal proxy of each industry's financial dependence. In other words, these calculations (and the corresponding ranking of industries, from the least financially dependent to the most) are thought to be invariant in time and space. It is crucial to stress here that the only difference between the EFD index and the measures of net lending discussed above (i.e. savings – capital expenditure) lies in the measure of internal funds of the firm adopted in the calculation. In the case of the EFD

index, the measure of internal funds is the cash flow, while in the case of net lending is the measure of internal funds represented by corporate savings.

At the same time, both measures (net lending and the EFD index) are intended to grasp the financial needs of the corporate sector. The EFD index is meant to be an indicator of the needs of corporations to access external financing, while corporate net lending measures the net resources that firms make available or require from other institutional sectors. Despite this similarity, the assumptions of the two measures and their applications in economic analysis are very different. As documented in Table 2, between 1990 and 2015 the corporate sector of G7 countries progressively shifted from net borrower to net lender positions, which implied that the financing role in the economy of the private sector became a net provider of funds to the rest of the economy. Moreover, corporate net lending is a dynamic measure that can fluctuate significantly, so that the private sector can switch from net borrower to net lender and *vice versa*. In contrast, the EFD index developed by Rajan and Zingales is meant to be a measure invariant in time and across countries. With the exception of temporary fluctuations due to exogenous shocks, industries are expected to have a constant ratio of cash flow and capital investment over time. It is evident that there is a tension between the two measures. Both indicators are expected to grasp close concepts (i.e. the external exposure of the corporate sector), but they entail very different assumptions, conclusions and implications for economic analysis. On the one hand, the rise of corporate net lending shows that financing needs are changing, and the role of the corporate sector is evolving substantially from one decade to the other. On the other hand, the EFD literature assumes that the external financial needs do not change significantly and are essentially constant in time and space. How is it possible to have such different approaches in two indicators that are so similar? This aspect has been largely overlooked by the existing literature and will be explored in more detail in the next sections.

Concluding this section, it can be highlighted that the shift of the corporate sector from net borrowing position to net lender has altered its "traditional" function of the corporate sector as a net demander of funding from the rest of the economy. The corporate sector is in the novel position of being a lender to the rest of the institutional sectors. This is a generalised trend that results from both the rise in corporate savings and the reduction of the rate of accumulation. After depicting these stylised facts, it is necessary to ask what reasons may have determined this shift. At the same time, net lending is not the only measure of financial needs of the corporate sector. Notably, the EFD index developed by Rajan and Zingales is also an indicator that grasps the need for external funds of the corporate sector. Despite the

similarity between the two measures, in the literature associated with Rajan and Zingales' EFD index and the literature on corporate net lending, there is no contact between authors employing these two types of measure. We try to fill this gap discussing the determinants of these two indicators.

In order to develop the argument in more depth, it is necessary to explore in detail each one of the facets that emerged in this section. To do so, the remainder of this chapter will focus on the following three points.

- The existing literature on corporate net lending and its shortcomings (Section 2.3).
- Alternative/complementary explanations of the rise of net lending (Section 2.4).
- The EFD index, related literature and critical assessment (Section 2.5).

2.3. Existing literature on corporate net lending: hypothesis, methods and shortcomings

The emergence of corporate net lending has attracted the attention of an increasing volume of studies aimed at exploring possible factors that contributed to this phenomenon. The aim of this subsection is to provide an overview of the existing literature on the topic, focusing on the hypotheses considered, the methodology followed and on the limitations of these studies.

A first hypothesis explored by the literature concerns the precautionary motive. This hypothesis links economic uncertainty and volatility of the business environment to the rise of net lending. The mechanism that regulates this hypothesis is quite intuitive: as firms face a more uncertain economic environment, they will be incentivised to increase the proportion of savings in relation to capital expenditure in order to create a buffer of liquidity needed to face unpredictable economic downturns.

This argument is borrowed from the literature on cash holdings, where this hypothesis has been explored extensively. The precautionary motive for cash holdings dates back to Keynes (1936), who first introduced the concept. According to Keynes, precaution was described as one of the causes, together with the transaction and speculative motive, that explains the desire of firms to hold cash. Numerous authors find a positive relationship between uncertainty and volatility and the level of cash holdings (Baum *et al.*, 2006; Bates, Kahle and Stulz, 2009; Sanchez and Yurdagul, 2013; Alfaro, Bloom and Lin, 2016). However, as noted by Gruber and Kamin (2016), the concepts of net lending and cash holdings are not strict substitutes. For example, the sale of long-term liabilities would increase cash holdings

without impacting on corporate net lending. Likewise, if firms used their savings relative to investment to repay their debt repayment, they would face an increase in net lending without any modification in cash holdings levels. For these reasons, it is not possible to automatically extend the same conclusions reached by the literature on cash holdings to that of net lending.

In fact, in contrast to the literature on cash holdings, investigations on corporate net lending find limited or no support of the precautionary or uncertainty hypothesis. To the best of our knowledge, the only work that backs this hypothesis is that of Armenter and Hnatkovska (2017) who offer a mathematical model that explains how firms can accumulate liquidity for precautionary motives. In spite of the elegance offered by their model, one major critique that can be raised is that many of the values involved in the calibration of the model are derived from the authors' assumptions and not from empirical estimation of the parameters. On the other hand, all the contributions that use econometrics do not find a significant role of uncertainty and precautionary motives on net lending. Brufman et al. (2013) employ a fixed-effect econometric model based on a panel data of listed NFC at firm-level from five countries (Germany, France, Italy, Japan and the UK) to assess the impact of uncertainty on the level of net lending. To test this hypothesis, they use five different variables of interest and perform panel data regressions for the period 1997-2011. According to the precautionary hypothesis, firms with a more uncertain environment are expected to have higher level of net lending. However, the authors find that all the measures of economic volatility are negatively associated with the level of net lending. The authors conclude that "contrary to what was expected […], we find a *smaller* [net lending level] among those firms facing a more volatile operating environment" (Brufman, Martinez and Pérez Artica, 2013, p. 11). Similarly, Saibene (2018) tests nine different indicators of volatility and uncertainty that might affect the level of net lending of American listed corporations. His results highlight that, as in Brufman et al. (2013), most of volatility and uncertainty measures are negatively related to net lending levels. Out of the nine different indicators considered, only two are positively and significantly related to net lending, while the others document a negative or non-significant relationship.

Gruber and Kamin (2015) take a different methodological approach in assessing the role of the precautionary motive. They refute the precautionary hypothesis through descriptive analysis only, observing the evolution of financial payments of G7 countries. According to the precautionary hypothesis, firms may decide to reduce or postpone investment because of economic uncertainty, deciding to hold higher share of liquidity, with the result of higher net lending. Hence, if economic uncertainty was a relevant factor for the rise in net lending, it

would be expected to lead to a decrease in financial payouts. However, this motivation contrasts with the consolidation of financial payouts disbursed, especially in the 2000s. The authors assert that:

> the counterpart of declines in resources devoted to investment has been rises in payouts to investors in the form of dividends and equity buybacks […]. The strength of investor payouts suggests that increased risk aversion and a precautionary demand for financial buffers has not been the primary reason firms have cut back investment (Gruber and Kamin, 2015).

An additional element in opposition to the precautionary motive can be derived exploring the relation of firm size to net lending. The precautionary hypothesis holds that firms with financial constraints and lower access to financial markets, such as smaller firms, should accumulate more liquidity in order to face unexpected turbulences. As smaller firms usually have a lower capacity to raise funds in the financial markets, they are expected to accumulate higher share of liquidity in order to face unexpected economic downturns (Brown and Petersen, 2011). However, this contradicts what happens in the case of net lending, where bigger firms record the highest volume of net lending (Dao and Maggi, 2018).[4] Considering this evidence, it can be concluded that the precautionary hypothesis does not appear to be very important in the determination of net lending.

A second hypothesis explored by the literature is that of deleveraging. According to this hypothesis, firms would accumulate liquidity in order to reduce their outstanding debt, contributing to the rise of net lending. The process of deleveraging is acknowledged by Cardarelli and Ueda (2006), who show how the level of corporate debt fell in G7 countries between 1990 and 2004. Notwithstanding this insight, the authors rule out a direct causality between deleveraging and net lending. They state that "debt repayment […] has not been the primary reason for companies' excess savings. Rather, […] non-financial corporations have tended to invest their excess cash flow primarily into equities and cash, rather than repaying debt" (Cardarelli and Ueda, 2006, p. 146). Additional assessment of the role of deleveraging is offered by more recent studies. Based on a large database of listed NFC in nine developed countries (Canada, France, Germany, Italy, Japan, Korea, Netherlands, UK and USA) that covers the period 1995-2015, Dao and Maggi (2018, p. 14) maintain that firms have not used higher savings to deleverage and show that the level of debt has increased in all the countries

[4] In Chapter 4 and 5 the link between net lending and firms' size will be explored in more detail.

in their sample (with the exception of Italy and Japan). This leads them to conclude that deleveraging is not relevant in explaining the rise in net lending.

This position seems to contrast with that of Cardarelli and Ueda who maintained that a process of deleveraging had been taking place. Part of this difference can be imputed to the different indicators implemented in the analysis. Dao and Maggi (2018) focus on the ratio of debt over corporate savings, while the Cardarelli and Ueda (2006) on the volume of financial liabilities. Moreover, the two papers cover a different time span, until 2004 in the case of Cardarelli and Ueda and until 2015 in the case of Dao and Maggi. However, and independently from these differences, it is important to stress that both authors agree that deleveraging has not been a relevant feature in the rise of net lending.

Saibene (2018) extends the discussion on deleveraging, focusing on firm size. He shows that there was a decline in the leverage ratio among smaller firms, but in aggregate leverage is steady or increasing. Since the level of aggregate deleveraging maintained a constant level (particularly for bigger firms) it is hard to associate it to the rise in net lending. The author concludes that "there is no sign of deleveraging on aggregate so that the increase in net lending does not seem to have much in common with the choice of the capital structure" (Saibene, 2018, p. 10). Overall, also the deleveraging hypothesis does not find empirical consensus.

In light of this evidence, another group of contributions does not concentrate on technical reasons but focuses on the role played by institutional factors as well as political and power relations between countries and social groups. The rationale behind this hypothesis is that higher profits are likely to fuel corporate savings, inducing a positive effect on net lending. Among the first authors to deal with the topic, André et al. (2007) suggest that savings are connected to the evolution of profits and changes in income distribution: "corporate saving was mainly driven by increasing profit shares in most countries, possibly related to a degree of wage moderation, and lower interest rates" (André et al., 2007, p. 5). Note that the authors explicitly stress the role occupied by wage moderation in developed countries as a possible source of profit growth that eventually led to the rise in net lending. Their analysis on this point is based mostly on descriptive statistics. An analogous approach is also pursued by Cardarelli and Ueda (2006), who report that profitability has increased markedly in most G7 countries. The authors suggest that this trend in profitability can be imputed to lower tax and interest payments and, to some extent, to profits originating in other countries. The role of the internationalisation of production is explored in more detail by Cesaroni et al. (2017), who analyse some possible determinants of net lending (borrowing) using country panel data

for the aggregate corporate sector for 18 countries between 1995 and 2014. They find that the ratio of foreign direct investment to GDP has a positive impact on corporate net lending. According to the authors, firms move production in third countries to exploit lower production costs. Lower production costs allow firms to increase their profit margin fuelling net lending.

These results are confirmed using firm-level panel data regressions for nine developed countries by Dao and Maggi (2018) during a similar time span. They find that the share of foreign sales has a positive effect on net lending. Another salient feature of their analysis is the positive link between profits (proxied by the cash flow of the firm) and net lending. This correlation is robust to different econometric specifications and to both pooled and fixed-effects estimations. To the best of our knowledge, Behringer and van Treeck (2018) are the only authors that include functional income distribution measures in their econometric estimates. They focus on the role of the wage share at the country level in the determination of aggregate corporate net lending and find a negative relationship between these two variables at the aggregate level for 20 countries.

Dao and Maggi (2018) also consider the role played by Research and Development (*R&D*) expenditure on net lending. The authors find a positive relationship between the level of *R&D* expenditure and net lending. The rationale behind this finding is that more innovative firms can decide to increase their corporate savings in order to finance their innovation expenditure in *R&D*. However, the significance of this relationship depends on the specification of the model. *R&D* has a statistically significant impact on net lending with pooled regression but not with fixed-effects estimation. With this latter estimation strategy *R&D* is significant only when controlling for one and two-year forward-looking specifications (i.e. $R\&D_{t+1}$ and $R\&D_{t+2}$). These results lead the authors to conclude that firms tend to save more one or two years prior the increase in *R&D* expenditure.

Another hypothesis tested by Saibene (2018) is that firms may be willing to accumulate funds for competitive reasons. Firms with relevant market power do not have to cope with highly competitive pressures from other firms, so that they can afford to lower their investment rate and accumulate financial resources. This idea stems from two considerations. First, Philippon and Gutierrez (2017) find that market concentration has a negative impact on investment. Notably, the authors also maintain that these results are not the consequence of low expected demand or financial frictions. Second, firms with stronger market power can accumulate larger liquid assets and allocate them to perform competitive practices such as acquisition of rival firms or predatory practices (Fresard, 2010; Valta,

2012). This hypothesis is tested via the Herfindahl-Hirschman concentration index to different econometric specifications. In most of the specifications the index is not statistically significant while when it is significant the coefficient has a low statistical magnitude.

Finally, taxation may play a role in determining the level of corporate net lending. Higher taxes can impact negatively on the level of net lending via the reduction of firms' net income. This hypothesis is tested by Cesaroni et al. (2017) at the country level and by Dao and Maggi. (2018) at the firm-level. Both studies find evidence of the negative relationship between the level of taxation and corporate net lending.

In light of the literature review presented in this section, it is possible to summarise some conclusions. With respect to the methodology implemented, most of the contributions can be classified into two groups. The first (e.g. André et al., 2007; Cardarelli and Ueda, 2006; Galizia and Steinberger, 2003) is based on descriptive methods to illustrate the evolution of net lending and other variables such as profits or leverage ratios. The second group (Brufman, Martinez and Pérez Artica, 2013; Gruber and Kamin, 2015; Dao and Maggi, 2018; Saibene, 2018) employs statistically more sophisticated statistical methodology, mostly constituted by fixed-effects panel data econometrics as main tool for hypothesis testing. In this case there is a certain degree of similarity in the methodology followed by the different studies. The standard specification of the regression models includes net lending (at the aggregate or firm-level) as the dependent variable and one or more variables of interest that are used to test the hypotheses under scrutiny. Finally, a set of control variables complements the analysis in order to avoid the omitted variables bias.

As to the conclusions reached by the literature, there are different hypotheses that have been explored (see Table 3 for a summary of the main works presented in this section). However, most of these hypotheses find poor or no empirical evidence in their favour. Consequently, the causes that contributed to this increase of net lending are still objects of discussion. This leaves substantial space for further exploration of the topic. This research addresses these gaps, focusing on two topics that stem from the existing discussion on net lending but that are missing or not fully developed by the existing literature:

- The relation between the rise in net lending and financial payouts. This relationship has been largely overlooked by the existing literature. Gruber and Kamin (2015) deal with the rise in financial payouts to discard the validity of the precautionary hypothesis. However, these authors do not explore the possible link between the evolution of financial payouts and the rise in corporate net

lending. This investigation fills this gap exploring the theoretical and empirical mechanisms through which financial payouts can impact on corporate net lending.

- The relation between the rise in net lending and functional income distribution. The existing literature shows evidence of the link between corporate profits, profitability and the increase in net income. Some authors signal the relevance of this relation by employing descriptive statistics only (Cardarelli and Ueda, 2006; André *et al.*, 2007). Although these studies are very useful to depict general trends, they do not provide a statistically solid evidence of the relevance of this link. Other research partially fills this gap, highlighting the role of profits at the aggregate level (Cesaroni, De Bonis and Infante, 2017) and at the firm-level (Dao and Maggi, 2018). However, these authors do not assess the role of factors' share in the determination of net lending. Only two works explicitly consider the role of aggregate functional income distribution in the determination of net lending (André, 2007; Behringer and van Treeck, 2018). While these antecedents provide very useful insights, this hypothesis has not been tested in detail at the firm-level. This research addresses this gap, by investigating the relationship between functional income distribution at the firm-level and corporate net lending.

Table 3. Main hypothesis considered in the literature on corporate net lending.

Hypothesis	Reference	Rationale
Uncertainty and volatility	Brufman et al. (2013), Gruber and Kamin (2015), Saibene (2018)	To face a more volatile and uncertain economic environment firms increase their savings Empirical evidence: Against this hypothesis
Deleveraging	Cardarelli and Ueda (2006), Dao and Maggi (2018), Saibene (2018)	The desire of reducing the existing level of outstanding debt induce firms to increase hold more liquidity and reduce their investment Empirical evidence: Against this hypothesis
Increase in profits and changes in income distribution	André et al. (2007), De Souza and Epstein (2014), Cesaroni et el. (2017), Dao and Maggi (2018)	Higher profits and profitability allow firms to increase their savings Empirical evidence: limited (mostly descriptive) and in favour of the hypothesis
R&D	Dao and Maggi (2018)	Firms save in order to finance their innovation expenditure. Empirical evidence: Partially in favour of the hypothesis
Strategic motives	Saibene (2018)	Firms save to increase their market power, in order to pursue acquisitions or predatory practices Empirical evidence: Against this hypothesis
Taxation	Cesaroni et al. (2017), Dao and Maggi (2018)	Higher taxes impact negatively on profits and net lending. Empirical evidence: In favour of the hypothesis

Source: Own elaboration

2.4. An innovative perspective on net lending: Financialisation and distributive patterns

In light of the gaps in the existing literature, this section explores two causes that can have contributed to the rise in net lending, i.e. the process of financialisation and the role of income distribution. Although there are numerous studies related to these two topics, there is little connection (especially in the case of financialisation) with the discussion of net lending. For this reason, after reviewing these two streams of literature this section describes the theoretical channels through which these two factors can have contributed to the rise of net lending.

2.4.1. Finance, financialisation and the rise of net lending

The size of the financial sector has expanded considerably in the last fifty years (Cournede, Denk and Hoeller, 2015, fig. 1). The consequences of this growth have been widely debated in the economic and finance literature. A common perspective is to regard the development of the financial sector as having a positive impact in relation to economic performance (see Beck et al., 2000). This view often builds on Schumpeter's (1911) analysis on the innovative

role of banks. A more developed financial system provides the external funds that firms need to expand their productive capacity, induce technological change and enhance growth (King and Levine, 1993). Along these lines, some investigations claim that there is a positive link between growth and development of the financial system (Rajan and Zingales, 1998) while others maintain that the growth of financial sectors boosts total factor productivity (Beck, Degryse and Kneer, 2014). Leaven et al. (2015) go even further, stating that the financial system is the engine of growth: "technological innovation and economic growth eventually stop unless financiers innovate" (Laeven, Levine and Michalopoulos, 2015, p. 1).

Other studies, however, dispute the idea that bigger financial systems are always beneficial for economic growth. Among the first papers to question this link, Arestis and Demetriades (1995; 1996) challenge the methodology followed by King and Levine (1993) and the validity of their results . They argue that institutional factors can play an important role in shaping the relationship between finance and growth. Implementing time series analysis instead of cross-sectional data, Arestis and Demetriades show that the link between financial development and economic growth is not as strong as is usually believed. Other scholars argue that the evidence in favour of the link between finance and growth is not uniform in time and among countries (De Gregorio and Guidotti, 1995), while another group of contributions find that economic growth can be harmed after a certain threshold of financial development (Herwartz and Walle, 2008; Arcand, Berkes and Panizza, 2012; Cecchetti and Kharroubi, 2012, 2015; Law and Singh, 2014; Samargandi, Fidrmuc and Ghosh, 2015). According to these authors, a well-functioning financial system is essential to guarantee steady economic development. In this sense, there is no contradiction with Schumpeter's argument regarding the role of the financial sector to contribute to the good functioning of the economy. However, they remark, the excessive growth of the financial sector may affect growth. This analysis, rooted in the neoclassical approach, argues that this reversal relationship is due to the fact that big financial sectors compete with other industries or scarce resources such as qualified workers (Tobin, 1984; Arcand, Berkes and Panizza, 2012). After a certain threshold the struggle to appropriate scarce resources would contribute to diverge resources from more productive sectors towards investments with high collateral and low productivity projects (Cecchetti and Kharroubi, 2015). In light of these works it can be concluded that the idea of a linear relationship between the size of the financial sector and growth is widely disputed in the literature.

In recent years, the number of studies that critically assessed the effect of the financial sector on the economy have increased. The area of inquiry has enlarged and is now assessed by

scholars from different background in social sciences (Ioannou and Wójcik, 2019). This stream of literature has commonly been labelled under the term “financialisation”. The contemporary process of financialisation stems from the crisis of accumulation of the seventies and from the subsequent deregulation and liberalisation of the financial markets that originated in this period.[5]

It is not easy to find a unique definition of financialisation. Here, it is convenient to follow Epstein who identifies financialisation with "the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operations of the economy and its governing institutions, both at the national and international levels” (Epstein, 2002, p. 3). Studies in financialisation have focused on wide range of facets of the process of accumulation and, more generally the economy and society (Sotiropoulos, Milios and Lapatsioras, 2013). Some examples include the impact of financialisation on economic growth (Tomaskovic-Devey, Lin and Meyers, 2015), everyday life (Langley, 2008; Pellandini-Simanyi, Hammer and Vargha, 2015; Hillig, 2019), self-perception and subjectivity (Aitken, 2007) and higher education (Eaton *et al.*, 2016).

Some authors have highlighted that the process of financialisation is not uniform everywhere. Along these lines, Dodig et al. (2016) maintain that the process of financialisation can be associated to country-specific regimes of growth (debt-driven private demand growth, export-led regime and domestic-led regime). Some authors focused on specific country-experiences, showing that financialisation manifested differently (in qualitative and temporal terms) across countries. For example, Davis and Walsh (2016) describe how the UK was among the first countries outside the US in which financialisation had a significant impact in shaping the economy, while Berghoff (2016) maintains that German corporations adapted to financialisation in more recent time (beginning of the 2000s) compared to other countries. Among Asian countries, Lapavitsas and Powell (2013) and Shabani and Toporowki (2015) argue that Japanese NFC have maintained at the margin of the process of financialisation. In light of this evidence, Brown et al. (2017) define financialisation as a “variegated” phenomenon which can manifest with various characteristics in different countries. What is important to remark here is that, despite the differences in which the process of financialisation is shaped across countries, this section is

[5] The historical origins of financialisation is also open to debate. While most of the authors conventionally place its origins in the 1970s, other scholars argue that financialisation (although not necessarily termed in this way) is rooted in the process of internationalisation of capitalism that occurred in the 19th century and at the beginning of the 20th century (see Fasianos et al., 2016). Irrespective of this debate, in our case it is useful to refer to the changes to the mode of accumulation that took place since the 1970s.

interested in describing the general tendencies brought by financialisation with respect to the evolution of financial payments and the effect on capital accumulation.

In order to identify the modalities through which the process of financialisation may have impacted on the level of corporate net lending, the focus here will be mainly on the post-Keynesian literature and in particular on the regime of accumulation associated with the financialisation process. Within this group of contributions, we focus specifically on two aspects: (1) the impact that financialisation has on the modification in the organisation of the firms and the consequent maximisation of shareholders value, and (2) the impact of financialisation on physical investment. These two aspects are closely connected and it is sometimes difficult to differentiate between them. However, it is convenient to assess these separately in order to stress two points: first, the changes of the internal logic through which corporations behave and how these changes impact on the desire to increase financial payouts of the firms; and second, to highlight the impact that the process of financialisation had in the reduction of capital accumulation.

The financialisation literature on firm governance, originating from the work of Lazonick and O'Sullivan (2000), maintains that since the end of the 1970s and the beginning of the 1980s there has been a major change in the internal organisation and operation of the firm. These modifications have been reflected in the redefinition of the priorities of private companies. Until the 1980s, firms were characterized by a "retain and reinvest" business model in which earnings were mainly spent in acquiring physical capital to expand production. The crisis of accumulation of the 1970s was followed by a radical process of liberalisation and deregulation of the financial sector. In this context, firms progressively moved towards the so-called "downsize and redistribute" regime. Within this paradigm, physical accumulation and output growth ceased to be the main aim of the firm. The maximisation of shareholders values became a priority for contemporary corporations. In order to satisfy shareholders' interests "top managers downsize the corporations they control, with a particular emphasis on cutting the size of the labour forces they employ, in an attempt to increase the return on equity" (Lazonick and O'Sullivan, 2000, p. 18). Under the downsize and redistribute regime, real growth of production is subsidiary or complementary to the maximisation of financial well-being and shareholder satisfaction in the short-run (Orhangazi, 2008b, p. 61). Managers aligned their interests with those of shareholders and financial returns became a shared objective by both sides.

The shift in paradigm from "retain and reinvest" to the maximisation of shareholder values finds the theoretical background in the so-called "agency theory", which emerged and

consolidated in business studies between the 1970s and the 1980s. Agency theorists (see Ross, 1973; Fama and Jensen, 1983; Jensen, 1986;) maintained that managers may be driven by personal interests and use their power to achieve personal interests in opposition with those of shareholders (Lazonick and O'Sullivan, 2000, p. 16). To contrast this selfish behaviour, market forces should have more power in governing the firms, and in influencing managers' operations. Financial markets became the instrument to discipline managers, and to align their interests to those of shareholders. Shareholders became the "principals" of the firms and managers their "agents". This process is examined by Froud et al. (2000), who stated that agency theorists believe that "firms exists for the benefit of shareholders who own the firm and who should exercise control so that the interests of management are beneficially aligned with those of the owner shareholders around the pursuit of profit" (Froud *et al.*, 2000, p. 5). This implied a "significant change in corporate governance from a focus of maximizing productive investment towards innovation and structural change to the maximization of shareholders' value" (Cozzi, 2016, p. 172).

The acceptance of the model of firm governance based on the maximisation of shareholders value depicted by Lazonick and O'Sullivan has resulted in different interpretations among scholars. Some non-mainstream authors claim that the shareholder-value approach could be valid for the Anglo-American context but may not reflect the reality of the European context (Almond, Edwards and Clark, 2003; Michell and Toporowski, 2013). Other authors also consider that there may be differences between American and European firms, but that, overall, the rise of shareholders value also characterises European firms (Goutas and Lane, 2009); and that the shareholder value orientation of the firm is a useful framework to analyse the process of financialisation taking place in European case (Tori and Onaran, 2018a). Along these lines, some scholars focused on the lag in deregulation in European countries (Sakinç, 2017) and maintained that the significant institutional changes of the market that occurred in the 2000s favoured the rise of shareholder value orientation of the firms in Europe. From this perspective, Peters (2011) provides different case studies of shareholder pressures that took place in European corporations.

Despite these differences in views, there are some aspects that characterise the mechanisms of the shareholders orientation of the firms that are common to both Anglo-American and European countries. One of these elements is represented by the diffusion of stock-option pay for managers. Under such scheme of remuneration, CEOs' income depends strongly on shares prices. Hence, financialisation implies pressure on corporate managers who have an interest in increasing share performance (Gleadle *et al.*, 2014). The link between stock return

and managers' compensation is widely documented by Perry and Zenner (2001) who prove that there is an increase in this relationship, in particular after 1993. Once it is established that CEOs' compensation widely depends on stock returns, it is easy to see that alignment of interests between managers and shareholders is complete. This mechanism of incentive contributed to the flourishing of CEOs' pay compared to workers compensation. Nowadays managers earn multiple (sometimes over a thousands) times the income of the average worker (Englander and Kaufman, 2004; Chizema, 2010).[6]

Another consequence of the intensification of the process of financialisation and the consolidation of shareholder power is that the demand for distributed dividends and other instruments, such as buybacks, is expected to rise (Hein and van Treeck, 2010, p. 215). According to Orhangazi, NFC switched "from long-term investment strategies to maximization of short-term financial gains and distribution of earnings to shareholders in the forms of dividends and stock buybacks" (Orhangazi, 2011, p. 11).

Dividends represent the most traditional instrument to distribute financial returns to shareholders. Under the regime of financialisation firms are expected to please shareholders offering high returns on their financial investments. This has the effect of increasing the amount of dividends paid, lowering the retention ratio of profits (Dallery, 2009). Buybacks (also called share repurchases) are a relatively new practice that is attracting increasingly more attention. This instrument became particularly important in countries like the US where this type of financial payment exceeded dividends in the 2000s (Lazonick, 2015).

The economic literature has explored different reasons behind the increase in buybacks. A traditional argument is that firms repurchase their shares in order to distribute excess cash flows (Jensen, 1986; Stephens and Weisbach, 1998). Similarly, some authors associate the increase in share repurchases to a deviation of firms' earnings above the trend (Dittmar & Dittmar, 2004) or the allocation of temporary excess of cash flow (Jagannathan et al., 2000; Grullon & Michaely, 2004). Moreover, share repurchases represent a more flexible channel to distribute liquidity, compared to dividends, which makes them more attractive to use excess cash (Jagannathan et al., 2000; Lee & Suh, 2011).[7]

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[6] Boyer (2005) points out that these instruments were originally meant to discipline managers from pursuing their own interests but end up contributing substantially to increase CEO's power in the political arena.

[7] Excess cash is defined as the quantity of cash holding in excess of optimal cash levels and it usually determined following the methodology of Opler et al. (1999). The logarithm of cash holdings is regressed on several variables (cash flow, net working capital, capital spending and R&D). After estimating the model, excess cash is equal to the antilog of the residual of the regression.

The financialisation literature has a more critical stake in the use of this instrument. From this perspective, financial motives are an important driver for the economic behaviour of firms. Therefore, buybacks emerge not in response to exogenous factors (such as excess cash flow) but are ex-ante instruments that are functional to the satisfaction of shareholders' interests. Lazonick (2010, 2017) maintains that share repurchases are used by CEOs to manipulate shares prices in order to increase theirs and shareholders' rewards and that often the inflated price of stocks bears little connection with innovation and the performance of the company. Empirical analysis on this topic finds evidence that managers use financial payouts to manipulate shares prices. Almeida et al. (2016) find that firms are more likely to repurchase their shares if the earning per share forecast falls below target, the management can increase shares buybacks in order to reduce the number of outstanding shares increasing their value.

These mechanisms are reinforced by the growing financial concentration that took place in the last decades through the process of mergers and acquisition. Corporate takeovers are usually accompanied by a higher returns on stocks (Toporowski, 2000, p. 62). This increased concentration and accrued purchasing of financial assets contributed to growing financial inflation (Toporowski, 2009).

It is important to stress that, within this context, dividends payments and share buybacks are two sides of the same coin. Under the regime of financialisation, these instruments are employed, together or separately, to fulfil the maximisation of shareholders value. In this respect, Grullon and Michaely (2002) find evidence for the so-called "substitution hypothesis" according to which firms can substitute dividends for share repurchases as an alternative instrument of financial payouts. Notably, they demonstrate that "firms finance their share repurchases with funds that otherwise would have been used to increase dividends" (Grullon and Michaely, 2002, p. 1649). This argument responds to those authors that maintain that dividends have been losing importance (Fama and French, 2001). American companies have not abandoned financial payouts but rather have changed instrument, shifting their preferences towards buybacks. A crucial consequence that the substitution hypothesis plays for our analysis is that dividends and share buybacks should not be treated as separate instruments that respond to different rationale. On the contrary they should be considered as complementary tools in the financialisation logic. As it will be clearer in the ensuing chapters, this has important consequences for the empirical strategy formulated in this research.

Therefore, it can be argued that under the maximisation of shareholder values and, more generally the process of financialisation, financial payouts are expected to rise. There is abundant evidence that confirms this proposition. Crotty (2005) shows that in the US the ratio of dividends and shares buybacks to cash flow have constantly been on the rise since the 1980s. Analogously, Onaran et al. (2011) demonstrate that net dividends in relation to gross operating surplus have more than doubled during the same period. Cordonnier (2006) reports similar results for French companies and also that, in the United States, dividends payments surpassed net profits. Adjaoud and Ben-Amar (2010) find that the rise in shareholders rights had a significant impact on the payouts strategy of firms. Lazonick (2015) demonstrates that for a consistent number of American companies in the 2000s, total payouts (dividends + buybacks) are higher than net income.

In summary, the reorientation of the corporate sector towards the maximisation of shareholder value meant the redefinition of the internal organisation of the firms. Despite the differences that may exist between the Americana and European context, there are some common aspects that emerge from this redefinition of corporate organisation. Financial returns became essential for corporations to maximise shareholders value in the short-run. This implied that the overall growth of dividend payments and shares buybacks.

According to the re-organisation of the firms with the consequent consolidation of shareholders values, the following proposition can be formulated:

Proposition 1: The redefinition of corporations towards the maximisation of shareholder value has increased the volume of financial payouts.

The second aspect explored in this subsection deals with the negative impact of financialisation on capital accumulation. This discussion relates to a broader discussion on the factors that contributed to the slowdown of capital accumulation.[8]

The theoretical mechanisms behind the relationship between financialisation and investment described in detail by Orhangazi (2008b, chap. 5). According to this author, there are two main modalities through which the financialisation of the economy impacts on capital accumulation. The first one refers to the crowding out effect of investment. If profit opportunities in financial markets increase compared to those in productive activities, firms will have an incentive to devote a higher share of their disposable funds to financial

[8] This slowdown in capital accumulation is associated to the disappearing nexus between profits and investment highlighted by different authors (Mason, 2015; Durand and Gueuder, 2018 and Gleadle et al., 2014 on the case of Pharmaceutical industry in the UK).

operations instead of investing them in productive activities. This is especially valid in the case external financing is constrained, so that the firm can only invest a limited amount of funds. This mechanism is accentuated since "the pressure on firm management to increase returns in the short run can force them to choose financial investments, which provide more rapid returns, as opposed to real investments, which provide returns in the medium to long-run" (Orhangazi, 2008b, p. 87).

Note that there is a certain similarity between this crowding out process with the argument proposed by mainstream economists in relation to the negative effects of the financial sector on economic growth (e.g. Cecchetti and Kharroubi, 2012). These authors maintain that the growth of the financial sector provokes the reallocation of resources towards low productivity sectors with high collateral (i.e. real estate). The idea that there has been a relevant diversion of funds from "real" high productive industries to low productive industries is shared also by post-Keynesian scholars (e.g. see Bortis, 2010). Different from mainstream authors, however, for post-Keynesians the shift towards low productivity sectors and the negative impact on economic performance is not related to factors such as the lack of human capital (Cecchetti and Kharroubi, 2012) or the lack of profitable "real" investment opportunities (Gruber and Kamin, 2015). In the post-Keynesian literature the focus is more on the rise of new forms of profitability associated to the financial sphere that drives this shift. This is typically the case for the real estate sector. The housing bubble has contributed to fostering the growth of a low productivity sector (construction) and contributed to the proliferation of financial activities associated with it such as securitisation, mortgages etc.

The second modality through which financialisation can harm capital accumulation of NFC is linked to the desire of the managers of firms (whose compensation depend on share prices) to accrue financial payments in the form of dividends and share repurchase. The demand for constantly rising stock-prices constitutes the perfect incentive to increase financial payments of the firms. This view is also taken in a recent ILO *Global Wage Report* that states that "financialization may have drained internal means of finance for real investment purposes away from corporations, through increases in dividend payments in order to boost stock prices and thus shareholder value, or through risky financial investments aimed at generating maximum short-run profits" (ILO, 2012, p. 56).

These two mechanisms are further reinforced by the already mentioned financial concentration and financial inflation which, by channelling resources towards takeovers and the purchase and sustain prices of financial assets, drains resources from real investment (Toporowski, 2000, p. 53, 2009, p. 153).

There are numerous contributions that support the hypothesis of the negative link between financialisation and investment, finding evidence of the negative impact of financialisation on physical investment. One common obstacle of this strand of research is the choice of the indicator that adequately captures financialisation (Stockhammer, 2004). To deal with this issue, most of the studies proxy the process of financialisation with financial payouts, especially dividends and, more recently, shares buybacks. The econometric strategy is to employ these proxies (together with control variables) as independent variables, with the investment in fixed capital as a dependent variable.

Empirical analysis is performed at aggregated sectoral level as well as firm-level. Within the former group, Stockhammer (2004) was among the first authors to test the effect of financial incomes and financial payments on physical investment. The econometric tests are based on country level data for the US, the UK, France and Germany. He finds mixed support for the negative impact of financialisation on investment. The effect of financialisation on the accumulation of capital is significantly negative in the US and in France, while it is lower in the UK and absent in Germany. These results must be interpreted in light of the period considered. At the beginning of the 2000s the UK was recording a historically low level of accumulation, while Germany was not fully embedded in the process of financialisation. More recent studies find that financialisation has a more generalised impact also among European countries (see below in this section). Oranghazi (2008b) also finds evidence that financial income and financial payments have a negative impact on the growth of physical investment. In addition to interest and dividends payments, the author also includes share repurchase of the firm among the explanatory variables. Arestis et al. (2012) address different aspects that may influence capital accumulation and extend the sample of countries to 12 OECD countries, and test the effect of economic uncertainty and aggregate demand on investment. Regarding the role of finance they find that the presence of speculative bubbles in stock markets crowds out expenditure in physical capital (Arestis, González and Dejuán, 2012, p. 271). Further support to this hypothesis is provided by Barradas (2017) for 27 European countries over the period 1995-2013. The author concludes that financial payments are prejudicial to physical investment, and that this evidence is pretty uniform across different countries (Barradas, 2017, p. 403).

Other scholars address these issues from a firm-level perspective. Oranghazi (2008a, 2008b) supports the results obtained at the aggregate level for American firms for the period 1972-2003. Davis (2018) extends the period of analysis to 2013 and confirms that shareholder orientation had a negative impact on fixed investment among American non-financial

corporations. These outcomes are supported also by the evidence provided by Turco (2018), who focuses on the role played by buybacks in a sample of listed American NFC. Tori and Onaran demonstrate that the negative impact of financialisation on investment is not exclusively an American phenomenon, but can be extended to European (Tori and Onaran, 2018a) and British firms (Tori and Onaran, 2018b). Importantly, the authors find that financial income has a positive impact on physical investment only in a minority of cases, while for the rest of the countries financial income is negatively correlated to investment among developed and developing countries. This factor responds to the counterargument that the increase in financial payments operations may be counterbalanced by higher financial income.[9] By showing that the negative impact of financial income, and considering the large sample of countries, the evidence confirms that financial activity has an overall negative impact on investment.

Other relevant contributions on the topic come from mainstream economists. For example, Lee and Suh (2011) focus on the relationship between buybacks and investment. They find that the increase in shares buybacks is linked to the reduction in their capital expenditure. However, different from the financialisation argument, the authors do not attribute a causal relationship that goes from financial payouts to the reduction in investment. Instead, they maintain that sluggish capital expenditure is due to a reduction in productive investment opportunities. As a consequence of this shift there is more liquidity that can be allocated to share repurchases (Grullon and Michaely, 2004). According to this interpretation, the fall in investment would happen independently from share repurchases and buybacks, simply representing an alternative use of available cash. Almeida et al. (2016) test such a proposition to evaluate if it is the lack of profitable investment opportunities that is associated with the rise of shares buybacks. They find that it is not the lack of profitable investment projects that drives the rise in buybacks, but it is the will of firms to increase the earnings per share, consistent with the commitment of maximisation of shareholder value. In other words, Almeida et al. (2016) find that what is important is the desire of corporations to manipulate shares prices to the repurchase of shares and that, importantly, the increase in share repurchases also has a negative impact on real variables, as it depresses investment, employment and R&D (Almeida, Fos and Kronlund, 2016). Note that this reduction would

[9] Similarly, Barradas (2017) finds that when the impact of financial income on investment is positive, the magnitude of this effect is lower than the negative effect of financial payouts on investment. Furthermore, Rabinovich (2019) shows that the level of financial income by firms has not increased significantly in the last three decades. This contrasts with financial payments that, as discussed, have risen.

not have occurred in the absence of share repurchases as "companies are willing to trade off employment and investment for stock repurchases" (Almeida, Fos and Kronlund, 2016, p. 184). This point is crucial to determine the causality of the relationship, from stock buybacks to the reduction of investment, and not *vice versa*.

The trade-off between share repurchases and investment is also highlighted by Davis (2018). She points out that her results "suggest that managers in industries in which average repurchases rise also face pressure to target financial performance indicators, and this pressure to reallocate funds toward financial targets squeezes fixed investment" (Davis, 2018, p. 21). This evidence supports Lazonick's claim that "buybacks represent a withdrawal of internally controlled finance that could be used to support investment in the company's productive capabilities" (Lazonick, 2017, p. 13).

Overall, the relationship between financialisation and investment can be summed up in the following proposition:

Proposition 2. The process of financialisation (proxied by financial payouts) contributes negatively to capital accumulation of the firm.

Once the channels through which the process of financialisation affects the internal organisation of the firm impacts negatively on investment have been explored, it is straightforward to see the connection with the rise in net lending. In order to maximise shareholders value, the desire of firms to increase financial payments should be reflected in higher disposable liquidity in the hands of corporations that is employed in the payments of financial payouts (*Proposition 1*). Additionally, the desire to increase financial payouts linked to the maximisation of shareholders values has an impact on the accumulation of fixed assets. Hence, it is possible to establish a negative relationship between financialisation and investment (*Proposition 2*).Since physical investment is one component of net lending, the depressive role that financialisation has on investment contributes to the increase in net lending. Overall, the changes in firm's behaviour and investment patterns represent two complementary channels through which the process of financialisation boosts corporate net lending. Since the process of financialisation embeds higher financial payouts it is possible to hypothesise a positive relationship between the process of financialisation, that can be proxied by financial payouts, and net lending.

2.4.2. Functional income distribution and the rise of net lending

The second aspect of interest for our research is related to functional income distribution, that is the distribution of income between factors of production, capital and labour. The

fundamental idea behind this motive is that part of the rise in net lending can be explained by different levels of income distribution (between profits and wages) at the firm-level. Since firms' net output is distributed between wages and capital owners, the polarisation in this allocation can fuel the rise of net lending.

To develop this idea is necessary to draw on the literature on functional income distribution and inequality. In doing so, it has to be acknowledged that in the last forty years most of the literature that dealt with inequality has focused on personal income distribution, while functional income distribution has occupied a secondary role. In our view, the predominance of personal income distribution over functional income distribution has to do with two main reasons.

The first reason is the predominance of neoclassical economics, and how its theoretical framework shapes academic and policy analysis. The rise of the neoclassical approach at the end of the 19th century brought a shift in the analytical focus and unit of analysis in economics. While social classes analysis was foundational in classical economics, neoclassical economists placed the individual at the centre of their investigation (Pasinetti, 1981, chap. Introduction). Consistent with this framework, studies on inequality reflect this atomisation, based on the individual as the main unit of analysis. According to Glynn:

> if an economy is divided into workers receiving only wages and capitalists/ landlords receiving only profits/rents, then the split of national income between wages and profits must have a major influence on personal income distribution. However as soon as the old slogan 'Everyman a capitalist' (the title of a Conservative Party pamphlet in the 1950s) starts having some reflection in reality, then the profits/wages split diminishes in importance as a direct determinant of personal income distribution (Glyn, 2011, p. 2).

As result of this process, class and factor shares analysis shifted from being the central aspect for economic analysis to a secondary (if not irrelevant) one. Perhaps, the best exemplification of this swing in paradigm can be illustrated by quoting Ricardo, for whom the determination of "the laws which regulate this distribution [between landowners, capitalists and labourers] is the principal problem in Political Economy" (Ricardo, 1951[1871], p. 5) and Blaug, who, some twenty years ago, aknowledged that "[t]he great mystery of the modern theory of distribution is why anyone regards the *share* of wages and profits as an interesting problem" (Blaug, 1996, p. 467; emphasis in the original).

Even though the rise in neoclassical economics explains this switch in the focus of analysis, functional income distribution was a quite prominent analytical category at least until the 1960s beginning of the second post-war period. It is only during the 1970s that personal income distribution became the predominant focus in the literature, in concomitance with the consolidation of human capital theory and large micro-level-data (Goldfarb and Leonard, 2005).

As a consequence of this shift, a second reason emerges to justify the predominance of personal income distribution over functional income distribution. Whilst functional income distribution disappeared from the research agenda, most of the literature simply assumed factor shares to be constant (e.g. Lagos, 2006; Mankiw, 2007). Accordingly Bentolila and Saint-Paul maintain that "[u]ntil recently, the labor share did not often generate an interest among neoclassical economists, partly because its constancy has been taken as a granted 'stylized fact of growth'" (Bentolila and Saint-Paul, 2003, p. 1).

For example, this belief is typically reflected in the standard use of the Cobb-Douglas production function. Within this framework the usual assumption is that the rate of substitution between capital and labour is equal to one. A reduction (increase) in the price of one factor is compensated by an equal increase (reduction) of the quantity of that factor employed in the economy. As a result of this specular movement the factors' shares do not change (Glyn, 2011, pp. 4–5). Once it is assumed that functional income distribution is constant over time, it is straightforward that the analysis of the evolution of wage and profit shares has no interest for economic analysis and can be removed from the research agenda. As a consequence of these two connected factors (the consolidation of the neoclassical individual-based approach and the idea that factor shares are constant) the attention on functional income distribution faded in the second half of the 20th century.

This scenario, however, is rapidly changing. "Factor shares are […] making a comeback" (Atkinson, 2009, p. 4). In the last two decades an increasing number of works have dealt with functional income distribution as a relevant topic for economic analysis. Research embraces a wide range of topics, including the impact of changes in factor shares on growth (Onaran and Galanis, 2014), the current account (Behringer and van Treeck, 2018), structural change and productive structures (Pyatt, 2001; Medeiros and Trebat, 2016), and indebtedness (Davanzati and Pacella, 2010).

The idea that factor shares are not constant is now accepted by most economists.[10] Since the seventies the wage share has decrease in most of developed countries with almost no exception. For G7 countries, the wage share in 2014 was between 5 and 13 points lower than it was in 1970 (OECD, 2015, fig. 3). The debate around the causes of this shift, however, is still open to discussion. It is not easy to isolate specific factors that contributed to the evolution of the functional income distribution. A first difficulty is due to the fact that potential causes are interconnected to each other so that changes in income distribution is a multifaceted phenomenon in which numerous factors intervene (ILO, 2012, p. 49).

One explanation of the decline of the labour share proposed by orthodox economists points to the reduction of the relative price of capital goods. As capital becomes cheaper, firms reduce their relative use of labour, moving towards more capital intensive techniques of production (Karabarbounis and Neiman, 2014). As mentioned above, the standard Cobb-Douglas production function assumes that the elasticity of substitution between capital and labour is equal to one. Under this scenario, the reduction in the price of one factor does not alter the relative shares of capital and labour. However, if the elasticity of substitution between capital and labour is higher than one the economy will increase the quantity of capital relatively more than the reduction in its price. As a result, the wage share will decrease when the capital intensity increases. On the contrary, the wage share would decrease if the elasticity of substitution is lower than one. Given the relevance of this issue, different contributions have tried to estimate the elasticity of substitution between capital and labour. Empirical evidence on this topic is mixed. Some studies (Karabarbounis and Neiman, 2014) estimate the elasticity of substitution to be higher than one, which supports the hypothesis that cheaper investment may be determinant for the reduction in the labour share. However, numerous authors contend this view, estimating coefficients of elasticity below the unity (Rowthorn, 1999; Chirinko, 2008; Chirinko & Mallick, 2017). When the elasticity of substitution is below one, the reduction of the price of one factor is not totally compensated by the relative increase in the use of that factor. Therefore, the idea that the labour share decreased because of the diminution of the price of capital goods is, to a large

[10] As a matter of fact, despite the wide consensus among economists (that consolidated in the second half of the 20th century), the idea of the constancy of income distribution has been object of discussion for long. In 1958 Solow challenged the belief "that the share of the national income accruing to labour is one of the great constants of nature, like the velocity of light" (Solow, 1958, p. 618). In this paper Solow was referring to Douglas's (1934) and Bowley's (1937) work that assumed that there the wage share was steady over time.

extent, not confirmed by empirical evidence. Thus, it is possible to conclude that the reduction in the labour share cannot be regarded as merely the technical outcome due to the reduction in capital price.[11]

Another group of literature has focused on the rising level of international competition as a possible vehicle that can contribute to the reduction in the labour share. In principle, the outcome of increased competition can have opposite outcomes (Guschanski and Onaran, 2017). On the one hand, higher competition from emerging markets can contribute to the reduction of profits, which can have a positive impact on the wage share. On the other hand, capitalists' competition could increase the downward pressures on the labour costs in an attempt to recover their mark-up margins. This latter scenario seems to fit better with the reality of developed countries, also considering the existence of domestic oligopolistic markets that permit firms to increase their mark-up (Joskow, 2010).[12] Along these lines, other works find that factors' share polarisation is amplified by the free mobility of capital (IILS, 2011) and higher trade openness that pushes firms to decrease wages in order to attract foreign investment (Burke and Epstein, 2001). Overall, these views argue that economic globalisation operates as an incentive to implement corporate-friendly policies that have a negative impact on the wage share.

These aspects are closely connected with the accepted idea that the decreasing bargaining power of workers has had a negative impact on the wage share, which is often mentioned as a cause contributing to the stagnation of wages (Onaran, 2011). As a result of these processes, the rate of growth of wages has been below that of productivity, which is mirrored in a reducing labour share (OECD, 2015; Stockhammer et al., 2018). Furthermore, the compression of wages has been encouraged by political institutions that regarded it to be a policy priority for developed countries (e.g. see EC, 2011, 2013; Stockhammer and Sotiropoulos, 2014).

Given this discussion, the analysis based on income distribution has different aspects of relevance for our research on corporate net lending. First, it has similarities with the classical political economy distinction between capital and wage earners. According to this view, the

[11] The short discussion provided here on the validity of the Cobb-Douglas production function focuses exclusively on the empirical determination of the coefficients and their relation to the stability of the wage and capital shares. There are additional theoretical criticisms that can be addressed (and that exceed the scope of this research). The reader can refer to Harcourt (1972) and Sylos Labini (1995), among others, for an in-depth discussion on the validity of the Cobb-Douglass production function.

[12] The idea that there is a negative relationship between the degree of monopoly and the labour share is not new. Kalecki (1954, chap. 2) theorises a negative relationship between the degree of monopoly and the labour share.

social product is divided between social groups as the result of the distributive forces of the groups at play, i.e. labour and capital. Moreover, an empirical approach based on functional income distribution is particularly useful with firm-level analysis where the division between wages and profits is theoretically and empirically more straightforward to capture than a potential measurement of inequality based on personal income distribution. This is because firms sell output which generates a stream of income that is then distributed between profits and wages. Therefore, it is relatively easy to differentiate the share of income that is appropriated by wage earners and that which goes into profits.

Most of the literature that employs measures of functional income distribution are based on aggregate country-level estimations of the factor shares.[13] However, other works provide different levels of measurement of factor shares. Some studies use estimations of the labour share at the industry level (Bentolila and Saint-Paul, 2003; Hutchinson and Persyn, 2012; Pianta, 2014) while others at the firm-level (Growiec, 2012; Autor et al., 2017; Houngbonon & Da Costa, 2017). The latter dimension is particularly important for our research. Chapter 3 will provide a more detailed discussion of the relevant indicators to grasp this dimension. Here it is sufficient to claim that although firm-level data are generally more difficult to gather in comparison to macroeconomic data, there are some advantages that arise from this level of analysis. Country level measurements may reflect the process of structural change, so that changes in the distribution of income may be due to a modification in the relative participation of industries in the economy. On the contrary, micro-level data allow one to capture changes that occur within both the firm(s) and the industry (Cirillo et al., 2018). This level of analysis permits an assessment of specificities that would not be possible to observe at the aggregate level. As it will be argued in more detail in the Chapter 4, net lending is not a uniform process across companies, so that testing our hypothesis at the firm-level allows a richer analysis than that provided by aggregate data.

In order to specify a theoretical relationship that links the distribution between profits and wages and the level of net lending, it is necessary to consider that the reduction in the wage share is directly linked with the increase in profits documented in the last 30 years (Barkai, 2016). Acknowledging this fact, it is possible to outline two ways in which functional income distribution can impact on the level of net lending. First, functional income

[13] The unadjusted labour share is usually measured as the ratio of total compensation to employees over GDP or national income (Luebker, 2003). This measure, however, does not include self-employed. In order to deal with this issue, other estimations adjust the computation of the labour share. A common procedure is to attribute to self-employed the same wage as wage earners (for a detailed discussion see Gollin, 2002; Arpaia et al., 2009).

distribution can impact on corporate savings. A lower labour share means that a smaller portion of income (or production) generated in the economy is appropriated by workers. Hence, the higher share of income that is appropriated by the capitalists has a positive impact on corporate savings, which boosts the level of net lending. Note that this argument is similar to that explored by existing studies that associate the rise in net lending to profitability (e.g. André, 2007; Cardarelli and Ueda, 2006). However, differing from these authors, our focus is explicitly on measures of factor shares and not on the level of profits. Moreover, our analysis focuses on factor shares at the firm-level, and not at the aggregate country-wide level.

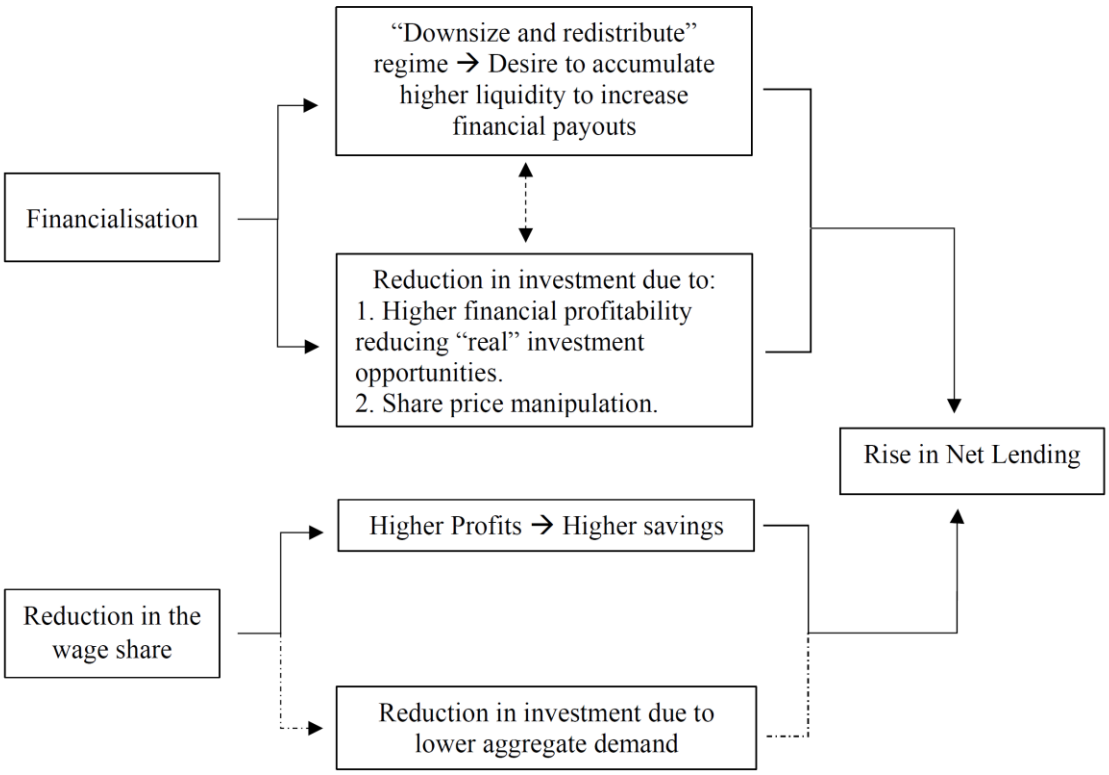
In addition to the impact on profits and corporate savings, aggregate changes in income distribution could also impact on the process of capital accumulation and, consequently, the level of net lending. The final impact on investment, however, can be ambiguous (Behringer and van Treeck, 2018). Some authors consider that a higher wage share can drive up the level of investment (Ranciere *et al.*, 2012; Onaran and Galanis, 2014). On the other hand, the fall in the wage share could also negatively affect the rate of physical accumulation because of the lower aggregate demand and consequent investment associated with it (Lavoie and Stockhammer, 2013). As to our focus of inquiry, if the increment in savings does not correspond to an equal increase in investment, firms experience an expansion in net lending. Note that a positive relationship between labour share and net lending results only if there is an inverse relationship between accumulation and labour share *and* if this effect offsets the positive impact of lower wage shares on corporate saving. At first sight, this possibility seems to be at odds with the aggregate trends, which show that the decline in the labour share coincided with the rise in corporate net lending. Therefore, it is to be expected that a lower labour share will impact positively on corporate net lending. This leads us to a third proposition:

Proposition 3. A lower labour share has an impact on corporate savings and investment, increasing the level of corporate net lending.

In light of the two channels explored in this section, the possible impact on the level of net lending deriving from the process of financialisation and the reduction in the wage share are summarised in Figure 1. Both financialisation and income distribution can possibly affect savings and investment. The financialisation process and the rise of shareholder value of the firms impact through the desire to hold more liquidity in order to increase financial payments and through the negative impact on investment. These two factors are closely linked and

influence each other, so that they are connected through a dashed line. Functional income distribution can impact on net lending via the increase of profits and corporate savings and changes on investment. This latter relationship, however, depends on the assumption regarding the reaction of investment to the rise of the wage share at the aggregate level. The diagram assumes a reduction of investment following the reduction in the wage share which is one of the possible outcomes –since this relationship is not unambiguous it is represented by a dashed line.

Figure 1. Financialisation and income distribution as driver of the rise in net lending.



Source: Author's elaboration.

2.5. EFD Index

The rise in net lending indicates that, at the aggregate level, corporate savings are sufficient to cover their capital expenditures, implying that the corporate sector has become a net provider of funds to the rest of the economy. Drawing from the discussion introduced in Section 2.2, this section analyses the concept of financial dependency starting with the definition proposed by Rajan and Zingales (1998). The aim of this section is to explore the properties of the original financial dependency index (that will also be referred to as Rajan

and Zingales index) and to make a critical assessment of the measures so that it is also possible to establish a link between this measure and that of net lending.

The main objective of the original paper by Rajan and Zingales (1998) was to explore the relationship between industries' external financial dependence, country wide financial development and economic growth. The authors maintain that industries that are more dependent on external finance grow at a faster pace in countries that have more financially developed markets. As there are some industries that are more financially dependent than others, the presence of more developed financial industry is necessary to enhance growth of these sectors. In order to test the degree of dependency of the firm, the authors propose what they call "EFD index".

The discussion is organised in three steps. First, we present the original index as elaborated by Rajan and Zingales, describing the estimation methodology and the values obtained. Second, we show the relevance that the index received in the existent literature. Finally, the section ends with a critical assessment of the index, focusing on the validity of the assumptions on which the external financial dependence index relies and its connections with the growth of net lending.

2.5.1. The original EFD index: methodology

The EFD index iss intended to reflect the "amount of desired investment that cannot be financed through internal cash flows generated by the same business" (Rajan and Zingales, 1998, p. 564). The values of the EFD index at the industry-level are derived from firm-level data. The index is calculated as follows. For each firm, its "dependence on external finance is defined as capital expenditure [...] minus cash flow from operations divided by capital expenditures" (Rajan and Zingales, 1998, p. 564). Analytically, for each firm *i* it can be expressed as:

$$\mathrm{EFD}_i = \frac{(\mathrm{KE}_i - \mathrm{CF}_i)}{\mathrm{KE}_i} = 1 - \frac{\mathrm{CF}_i}{\mathrm{KE}_i} \qquad (1)$$

where KE_i is capital expenditure and CF_i is the cash flow from operations. The index is first computed at the firm-level over a period of ten years. This procedure "smooths temporal fluctuations and reduces the effects of outliers" (Rajan and Zingales, 1998, p. 564) so that annual peaks are absorbed in a longer time span. The original Rajan and Zingales estimation of the index is performed using data for listed American firms during the 1980s. Once firm-level EFD indexes for each decade are estimated, the industry-level values are obtained by

taking the median of the individual values of the firms belonging to each industry. Hence, there will be as many values of the index as the number of industries analysed.

A crucial aspect is that, according to Rajan and Zingales, the EFD index is meant to reflect sectoral technological features of each industry: "[w]e assume that there is a *technological reason* why some industries depend more on external finance than others" (Rajan and Zingales, 1998, p. 563; our emphasis), so that some sectors are inherently more dependent on external finance than others.

There are two central assumptions behind the measure that support the validity of the index:

- The first assumption is that, in a context of perfect capital mobility, external dependence does not vary across countries. In the authors' words, the assumption is that "technological differences persist across countries, so that we can use an industry's dependence on external funds as identified in the United States as a measure of its dependence in other countries" (Rajan and Zingales, 1998, p. 563). Since the capital market in the US is virtually frictionless, firms can raise as much funds as they wish, so that the EFD index for American firms should be a good proxy of the "real" financial dependency of the sector. Hence, the amount of external finance used by large firms in the United States is likely to be a relatively pure measure of their demand for external finance (Rajan and Zingales, 1998, p. 564).
- The second assumption regards the invariability of the index along time. According to this assumption, in a frictionless financial environment the amount of external finance demanded does not vary in time. Hence, calculations obtained for the 1980s are meant to be a good proxy of the structural demand for external funds also in other periods.

These assumptions regulate the theoretical construction and empirical estimation of the EFD index. However, they do not imply that all firms in a given industry will have simultaneously the same external dependence level. Rajan and Zingales recognise that firms at different stages of their life cycle tend to have different external dependence needs. Younger companies that are in an earlier stage of the product cycle are expected to be more dependent on external finance than more established firms. This will be reflected in the value of EFD index of younger firms that is expected to be higher than that of older firms. Following this rationale, there can be differences in the overall value of the EFD index across countries,

such as the case of developing countries where firms are expected to be in a different life cycle (less mature) than American companies. For this reason, Rajan and Zingales estimate the index for listed American firms during the 1970s, arguing that the "younger" life cycle corresponding to this decade will be more appropriate to grasp the technological characteristics of less developed countries: "given that our sample is biased toward developing countries, one might think that the US industry in the 1970's might be a better proxy for the position of developing countries" (Rajan and Zingales, 1998, p. 565). Therefore, the only difference between firms in developed and developing countries is that in the former group of countries firms are in a less mature stage cycle compared to firms in more developed countries. Once companies move to mature stages of production, it is to be assumed that the EFD is similar to that of listed American companies in the 1980s. No other factors are considered to be influential in the determination of different EFD values across countries. As it will be illustrated in the following subsections, this aspect has relevant implications for our analysis.

Rajan and Zingales also recognise that there might be shocks that influence external financial dependence. However, these shocks are not supposed to have a permanent role in the modification of the levels of EFD. They further aknowledge that even if shocks affect differently countries around the world, the impact on the individual industry in different countries would be the same because "the determinants of the cash flow to capital are similar worldwide" (Rajan and Zingales, 1998, p. 565). This means that if there is a shock in sector *x* in country *j*, the impact would affect equally sector *x* in other countries. This is important because it rules out the possibility that technological shocks can alter significantly the EFD across countries, so that the first assumption presented above holds.

Overall, this discussion can be resumed with the idea that the EFD index calculated for the American firms during the 1980s is a good universal proxy of the external dependency of the industries worldwide.

The values for the EFD index derived from Rajan and Zingales for each of the industries are detailed in Table 4. It should be appreciated that most of the values are between 0 and 1. Five industries record values below zero and four have values higher than one. With a negative EFD index the industry is considered to be virtually not dependent on external finance, as the cash flow generated by the firm is sufficient to cover their capital expenditure. According to Table 4, the least dependent industries mostly correspond to more traditional sectors, while more dependent firms tend to be more sophisticated industries. This

classification is coherent with the argument that more advanced industries will need more capital and therefore external funds.

Table 4. Rajan and Zingales index of external dependency.

Industry	Value	Industry	Value
Tobacco	-0.45	Furniture	0.24
Pottery	-0.15	Metal products	0.24
Leather	-0.14	Basic excluding fertilising	0.25
Spinning	-0.09	Wood	0.28
Footwear	-0.08	Transportation equipment	0.31
Nonferrous Metals	0.01	Petroleum and Coal	0.33
Apparel	0.03	Motor vehicle	0.39
Petroleum refineries	0.04	Textiles	0.40
Non. metal Products	0.06	Machinery	0.45
Beverages	0.08	Ship	0.46
Iron and Steel	0.09	Other industries	0.47
Food products	0.14	Glass	0.53
Pulp, paper	0.15	Electric machinery	0.77
Synthetic resins	0.16	Professional goods	0.96
Paper and Products	0.18	Radio	1.04
Printing and Publishing	0.20	Office and computing	1.06
Other chemicals	0.22	Plastic products	1.14
Rubber products	0.23	Drugs	1.49
Average	0.29		
Source: Rajan and Zingales, 1998			

2.5.2. Literature on EFD index. Applications and alternative estimations

After describing the main characteristics of the EFD index it is worth looking in more detail to the literature that relates to the original work of Rajan and Zingales. The EFD index had a deep influence in the financial and economic literature. The original paper by Rajan and Zingales counts more than 9,000 citations.[14] Although not all these works engage with the EFD index, this measure has been included in a wide range of applications.

One of the most prominent features is that the great majority of the studies that employ the EFD index do not replicate the estimations of the index with new data but use the very same industry values obtained by Rajan and Zingales in their calculations for American firms during the 1980s. A common practice is to implement the EFD index in regression analysis as proxy of industries' financial dependence together with other regressors. Among the works that apply the same values estimated by Rajan and Zingales (i.e. those reported in Table 4), Cetorelli and Gambera (2001) explore the link between banking market structure

[14] At September 2019.

on growth on a sample of 42 developed and underdeveloped countries. The industry-level EFD index is interacted with country-level indicators of bank concentration and financial development. Beck (2003) shows that countries with a more developed financial system record a better performance in those industries with higher EFD. Their sample includes 56 countries. To deal with the differences between countries they also run their regressions adopting the index with values for the 1970s. This practice relies on the above-mentioned idea that industries in less developed countries have a similar external dependency index to that of the US in the 1970s. Braun and Larraín (2005) investigate the relationship between external dependency and output contraction in periods of economic slowdowns. They use the average of the two periods (1970s and 1980s) to run their analysis. In Raddatz (2006) the EFD measure is implemented as a proxy of liquidity needs of the corporate sector, to verify whether the growth of the financial sector reduces output volatility. Fisman and Love (2007) revisit the original paper of Rajan and Zingales in order to test the original conclusions of the original paper. Other works focus exclusively on developing countries. For example, Fernández et al. (2013) apply the values of the EFD index calculated by Rajan and Zingales to determine the influence of bank competition on banking crisis in 30 developing countries.

Regardless the specific applications of the EFD index made by different authors, most of this literature accepts the assumptions of stability of the index across countries and in time. Sometimes, these assumptions are stated explicitly: "External finance dependence reflects technological characteristics of an industry that are relatively stable across space and time" (Igan et al., 2016, p. 15)[15] while in some cases these assumptions are tacitly accepted. In the latter case, it can be presumed that the assumptions still hold, since the EFD index is often utilised in research that involve several other countries than the US and embrace periods different from the 1980s.

The standard argument that justifies the use of the same values of the EFD index obtained by Rajan and Zingales is that American values represent a good proxy of a frictionless financial environment. Along these lines, Fernández et al. argue that American data are an appropriate benchmark because the "relatively open, sophisticated, and developed US

[15] Equivalent statements can be found also in other studies. For example, Fernández et al. maintain that "[a]n important assumption underlying it is that external dependence reflects technological characteristics of the industry that are relatively stable across space and time" (Fernández, González and Suárez, 2013, p. 26) and Dell'Ariccia et al. state that "[a]n important assumption underlying our approach is that external dependence reflects technological characteristics of the industry that are relatively stable across space and time" (Dell'Ariccia, Detragiache and Rajan, 2008, p. 96).

financial markets should allow US firms to face fewer obstacles in achieving their desired financial structure than firms in other countries. This approach offers a valid and exogenous way of identifying the extent of an industry's external dependence anywhere in the world" (Fernández, González and Suárez, 2013, p. 26). Cetorelli and Gambera raise some concerns about the potential problems that could derive from the use of results restricted to American firms: "it is […] worthwhile remarking that our results are shielded by a potentially important objection. External financial dependence in the data set is measured on US sectors" (Cetorelli and Gambera, 2001, p. 632). In response to this argument, they maintain that countries with analogous economic development also have similar industry structure, so that it is possible to extend the original estimations to non-American firms. However, this approach does not seem to be totally consistent with their empirical strategy, since Cetorelli and Gambera (2001) employ the values of the EFD also to countries that can be hardly considered to have a comparable economic development to the US (e.g. Colombia, India, Pakistan, Peru, among others).

Beck (2003) comes back on the validity of the assumptions. It is worth to quote him in length:

> In countries with perfect and atomistic capital markets, however, Rajan and Zingales note that individual large firms that constitute a fraction of the overall market and therefore have no market power might face a perfectly elastic supply curve, so that the actual use of external finance by these firms would primarily reflect the demand for it. Assuming that the variance of the reliance on external finance across industries persists across countries, we can thus use the actual external dependence of industries as observed for large firms in a country with a relatively well-developed financial system as proxying for the "natural" dependence of industries on external finance in other countries (Beck, 2003, p. 300).

This passage is important because it stresses that the index on EFD relies on the idea that firms have no restriction to credit supply and that firms are perfectly competitive ("large that constitute a fraction of the overall market"). This is a central corollary behind the construction of the EFD index. Firms involved in the calculations are assumed to be representative of the industry which is consistent with the view of the EFD index as a measure capable of grasping the natural features of the industries.

From this review it emerges that all the works considered so far share the idea is that if industries around the world had the same financial access than firms in the US, the external financial needs would be the same. The only difference that could exist relates to the life

cycle of the firm that may determine variations in the index. When this problem is recognised, it is usually overcome by employing the results for American firms during the 1970s.

Even though most of the literature adopts the same values published in Rajan and Zingales (1998) paper, there are few works that have attempted to reproduce the EFD index. Raddatz (2006) estimates a new EFD index following the same methodology of Rajan and Zingales, covering a similar sample of firms and during the 1980s. The most relevant difference with the original analysis is that Raddatz increases the number of industries under scrutiny, from the original 36 to 70. As to the industry-values of the EFD index, Raddatz's results are in line with the those of Rajan and Zingales. While most of the industries have EFD values comprised between zero and one, 17 industries have negative EFD indexes, while only two sectors record values higher than one.

Kroszner et al. (2007) employ the EFD index in order to study how banking crisis affect the activity of sectors, depending on their level of external dependence among 38 countries. The authors admit that "financial dependence for US firms in the 1980s may not be a valid benchmark for other countries, especially developing countries that may use different technologies" (Kroszner, Laeven and Klingebiel, 2007, p. 203). In order to deal with this aspect, they estimate four different sets of EFD indexes. The first two calculate the EFD index for, respectively, American firms in the (1) 1970s and (2) between 1980 and 1999. This is coherent with Rajan and Zingales's argument that an estimate of earlier periods may be a good benchmark for the external financial dependency of developing countries. The third one calculates the EFD index for Canadian firms, in order to catch possible differences with American firms' results. Lastly, they create a new dependency index that is equal to the average EFD index of 18 developed countries during the 1990s.

It is worth looking at some of their estimations in more detail. Table 5 reports the values of the EFD calculated by Raddatz et al. for 36 American industries between 1980 and 1999 and for the 18 countries during the nineties. A first aspect to highlight is that the estimations for American firms for the period 1980-1999 show that the external financial dependency is remarkably lower compared to Rajan and Zingales estimations. The average EFD index inRajan and Zingales calculations is 0.29 (see Table 4) while in the case of Kroszner et al. it is -0.05. This means that in the latter case industries are appreciably less dependent on external finance than they are in the original measurement. The fact that the values of the index are lower when extending the period of analysis may suggest that American firms became less dependent on external finance from the eighties to the nineties, which contrasts

with the assumption of stability of the EFD values in time. More than half of the industries record a negative index during the period 1980-1999. A negative value of the EFD index means that the industry is virtually not dependent on external finance as the cash flow is high enough to cover capital expenditure. This is a remarkable point, as it implies that most of the industries generate enough cash flow to finance their capital expenditure. Also the estimation of the EFD index for non-crisis countries shows industry values that are usually lower than the original Rajan and Zingales estimations, with a third of the industries with negative values.

Table 5. Alternative estimations of the EFD index. Kroszner et al. (2007) calculations.

Industry	EFD index 1980-1999 US only	EFD index non-crisis countries 1990s	Industry	EFD index 1980-1999 US only	EFD index non-crisis countries 1990s
Tobacco	-1.14	-0.25	Furniture	-0.38	-0.02
Pottery	-0.41	-0.17	Metal products	-0.25	0.08
Leather	-0.95	-0.14	Basic chemicals	-0.19	-0.01
Spinning	-0.05	0.14	Wood	0.05	0.24
Footwear	-0.74	-0.21	Transportation equip.	-0.08	-0.04
Non-ferrous Metals	-0.12	0.18	Petroleum and Coal	0.13	-0.11
Apparel	-0.21	0.07	Motor vehicle	0.06	0.04
Petroleum ref.	-0.02	-0.19	Textiles	0.01	0.43
Non-metal Prod.	-0.29	0.00	Machinery	-0.04	0.03
Beverages	0.03	0.03	Ship	0.38	0.19
Iron and Steel	0.05	0.26	Other manufacturing	0.28	0.31
Food products	-0.15	0.05	Glass	0.03	0.02
Pulp, paper	-0.07	0.06	Electric machinery	0.24	0.25
Synthetic resins	0.03	0.07	Professional goods	0.72	0.26
Paper Products	-0.35	0.04	Radio	0.70	0.33
Printing and Pub	-0.42	-0.04	Office & computing	0.54	0.60
Other chemicals	-0.30	-0.03	Plastic products	-0.02	1.55
Rubber products	-0.02	-0.09	Drugs	2.43	1.36
Average:	-0.05	0.15			

Source: Kroszner et al. (2007)

Another relevant study that calculates a new version of the EFD index is that of Hsu et al. (2014). The authors include the EFD index in their analysis in order to prove that industries that are more dependent on external finance are more innovative in countries that have a more developed equity market. As Rajan and Zingales, Hsu et al. assume that the index does not vary across countries: "under the […] assumption that industry characteristics based on US firm data carry over to other countries, we use these characteristics to help us identify the effect of financial market development on innovation in a cross-country setting" (Hsu, Tian and Xu, 2014, p. 123). The methodology followed in the creation of the new EFD index is similar to that of Rajan and Zingales, although there are some modifications.

The most significant difference with the original calculation, is that Hsu et al. include *R&D* expenditure into fixed capital expenditure. *R&D* expenditure is considered to be one of the main components of intangible capital (Falato, Kadyrzhanova and Sim, 2013). The rationale behind its inclusion is that industries, especially more innovative ones, may need to face sizeable R&D expenditure. This need would not be grasped by the original measure of the EFD index that only relies on physical capital expenditure.

In analytical terms this is:

$$\text{EFD\_HSU} = \frac{[(\text{KE} + \text{R\&}D) - \text{CF}]}{(\text{KE} + \text{R\&}D)} = 1 - \frac{\text{CF}}{(\text{KE} + \text{R\&}D)} \qquad (2)$$

Where EFD_HSU represents the EFD index developed by Hsu et al. (2014). In addition to the inclusion of *R&D*, there are two other methodological differences with respect to Rajan and Zingales estimations. First, the estimation covers a large span of years, from 1976 to 2006, different from the original calculations that focused on the 1980s only. Second, the value of each industry's EFD index is determined as the median of the individual firm EFD index over the period of analysis. In order to estimate the industry value, they first estimate the yearly median of all firms' external dependence within one sector. In this way, for each industry they obtain a series of yearly values. Afterwards, the final industry value of the HSU_EFD index is equal to the "timeseries median of [each] industry'[s] dependence on external finance during the period" (Hsu, Tian and Xu, 2014, p. 124). Table 6 shows the results for the index calculated by Hsu et al. (2014). The first peculiarity of this calculation is that all the values are above one. This contrasts with Rajan and Zingales estimations where most of the values were comprised between zero and one. Additionally, the ranking of the industries seems considerably different from that of Rajan and Zingales. It is not possible to have perfect match between the two estimates because of the different industry classification. Nonetheless, it can be appreciated that some of the least dependent industries in Table 6 (e.g. machinery and computers; electronic and electrical equipment) are among the most dependent industries on external finance according to Rajan and Zingales (Table 4). Meanwhile, for other industries the situation is reversed. Industries with little dependence on external finance in Rajan and Zingales, such as Tobacco, Apparel and Furniture, record the highest values in Hsu et al. (e.g. Tobacco; Apparel; Furniture). Note that the fact that some of the industries that have the highest financial dependency index are traditional industries (Tobacco, Apparel and Furniture) contradicts the idea that highest financial dependency is to be found among more advanced activities.

The difference with Rajan and Zingales values can be imputed to various reasons. To start with, the formula in the calculation of EFD_HSU differs from that of Rajan and Zingales. While the latter calculate the cash flow and capital expenditure for the whole period, Hsu et al. (2014) compute yearly values of the index in each industry and then calculate the median of the yearly values. Moreover, EFD_HSU is calculated over the period 1976-2006. Finally, the inclusion of R&D expenditure does not make the two indexes fully comparable. However, since both KE and R&D are strictly positive magnitudes, the denominator in equation (2) should be higher than Rajan and Zingales estimates. Therefore, EFD_HSU should record lower (and not higher) levels of EFD than Rajan and Zingales estimates.

Table 6. EFD index by industry (SIC 2). Hsu et al. (2014) calculations.

Industry	Value	Industry	Value
Chemicals	1.028	Rubber and plastic	1.203
Petroleum refining	1.035	Primary metals	1.203
Stone, Clay, Glass, and Concrete	1.102	Measuring and Controlling Instr.	1.205
Paper	1.104	Leather and leather products	1.237
Printing and Publishing	1.124	Furniture and fixtures	1.241
Machinery and computer equip.	1.126	Fabricated metal products	1.286
Textile Mill	1.131	Tobacco	1.290
Electronic and electrical equip.	1.168	Miscellaneous manufacturing	1.304
Food	1.174	Transportation equipment	1.309
Lumber and wood, except furniture	1.177	Apparel	1.474

Source: Hsu et al. (2014)

Table 7 resumes the main characteristics of the works that have elaborated EFD indexes. Altogether, the evidence proceeding from other estimations suggests that there may be significant differences in the values of the index. It can be argued that the different estimation strategy (e.g. Hsu et al., 2014) or the different period covered (e.g. Kroszner et al., 2007a) may have contributed to reach different results from Rajan and Zingales'. Nonetheless, this represents a further element that indicates that EFD measures can vary over time, in opposition to the standard assumptions accepted by the literature. This evidence contrasts with the idea that the measure elaborated by Rajan and Zingales is a good *universal* proxy for the EFD. Surprisingly, however, there is little or no discussion around the theoretical foundations behind the construction of the EFD index, especially with respect to the two assumptions of invariability across space and in time. The next subsection addresses some aspects that are usually overlooked by the existing literature on EFD.

Table 7. Summary of the main of the EFD elaborated in the literature.

Reference	Coverage	Notes
Rajan and Zingales (1998)	1980-1989	Sample: Listed American firms. Methodology: Median of the whole period Data source: Compustat
Raddatz (2006)	1980-1989	Sample: Listed American firms Methodology: Median of the whole period Data source: Compustat and CRSP
Krozsner et al. (2007)	1980-1999	Sample: Listed American firms. Methodology: Median of the whole period Data source: Compustat
	1990-1999	Sample: Listed firms from 18 developed-non-crisis countries Methodology: Median of the whole period Data source: Worldscope
Hsu et al. (2014)	1976-2006	Sample: Listed American firms. Methodology: Median of the median of yearly values R&D expenditure added to KE Data source: Compustat
Source: Own elaboration		

2.5.3. Critical assessment of the EFD

2.5.3.1. Assessment of the EFD in relation to corporate net lending

In light of the literature presented in this section, it is possible to provide a critical assessment of the EFD index in relation to the rise of corporate net lending.

In the previous subsection we have highlighted how some scholars have estimated lower values of the EFD index (i.e. Kroszner et al., 2007) and that this difference may partly due to a decrease in time of the EFD. The reduction in these values indicate that firms became less dependents (and often virtually not dependent when they are below zero) on external finance. This point bears a close similarity with the idea behind the rise of net lending. As explained in the previous sections, the rise in corporate net lending implies that corporations ceased to be net demanders of funds and became net providers of funds to the rest of the economy. This concept is coherent with the idea that firms have become less or no dependent on external finance.

In order to compare the concepts, recall the analytical definition of the two measures, corporate net lending and the EFD index:[16]

[16] For simplicity subscripts are omitted from the formulas.

$$\mathrm{NL} = \mathrm{Savings} - \mathrm{KE}$$

And

$$\mathrm{EFD} = \frac{(\mathrm{KE} - \mathrm{CF})}{\mathrm{KE}} = 1 - \frac{\mathrm{CF}}{\mathrm{KE}}$$

By looking at the formulae it can be immediately grasped that the two indexes compare a measure of internal funds of the firm and capital expenditure. In the case of net lending it is the result of a subtraction, while in the case of the EFD it is a ratio. However, the only significant difference between the two measures relates to the indicator of the internal funds of the firms. While net lending relies on corporate savings, the EFD index employs the cash flow.

Therefore, it can be established that the two indicators will grasp different phenomena only to the extent that the measure of corporate savings and cash flow are significantly different. Conversely, if the corporate savings and cash flow are similar measures, the two indexes will be measuring substantially the same phenomena. This point will be addressed in detail in Chapter 6. More specifically, in order to test the difference between the two indices, it will be necessary to perform two connected steps:

- Examine the definition of corporate savings and cash flow from the accounting perspective in order to establish the difference between measures.
- Explore the empirical relationship between the two indicators to establish if their computation provides different outcomes.

This discussion is relevant for different reasons. In spite of the similarity between the measures, the literature on net lending and on EFD constitute two separate fields of research with no relation to each other. The former treats net borrowing/net lending as intrinsically dynamic. Although firms are traditionally believed to be net borrower, this situation can be reverted and can fluctuate, as testified by recent trends. Moreover, the determinants of corporate net lending are an object of an extensive discussion which includes a wide range of possible explanations. On the other hand, the EFD index relies on a very different construction. The determinants of the index are supposed to be static, for the reasons detailed in the previous sections, and are exclusively related to technological aspects. This is in open contrast with the variability of net lending.

If the two measures are found to be similar, then the discussion behind the rise of corporate net lending becomes determinant for the EFD index. At the same time, it would imply that

the EFD index is a proxy of corporate net lending and that consequently the idea of steady technological features behind the determination of the index does not hold. In view of this discussion it can be concluded that:

Proposition 4. Corporate net lending and EFD index can be considered similar theoretical and empirical constructs.

2.5.3.2. Further issues related to the EFD index

In addition to the aspects explored in the previous subsection, there are other important points to take on board while assessing the EFD index. These issues consider different scenarios that can alter the assumptions of stability of the index between countries and across time that, as detailed above, are foundational for the EFD measure.

First, we shall bear in mind that the EFD index relies on the fact that the supply of credit has no restrictions. This implies that the index reflects the optimal demand of external funds. The most straightforward objection to this view is that a frictionless supply of credit may not reflect the reality of many developing countries. As illustrated above, although some studies raise this point (e.g. Cetorelli and Gambera, 2001) the existing contributions end up employing the same values obtained for American firms. A possible counterargument to this point could be that the EFD reflects the financial dependence of industries *if* capital markets were frictionless. In this context, it could be argued, industries' external dependence would be comparable to that of American industries even among developing countries. However, the index is not simply a theoretical measure as demonstrated by its diffusion among empirical research. Therefore, it seems problematic to extrapolate results for American companies, that are based on very specific assumptions, and extend them to different countries with very different economic structure. As shown, a consistent bulk of literature uses the EFD in countries where the assumption of frictionless countries is hardly acceptable.

More importantly, there are other aspects concerning technical change that are mostly overlooked and that we should consider here. The intention of the index is to grasp the "technological reasons" that determine financial dependence of each industry. These technological characteristics of each industry, that determine their EFD indices, appear to be static. This is reflected by the fact that values estimated for American firms during the 1980s are expected to be a good universal proxy of EFD for other countries and different periods. The only variations that are admitted regard developing countries. In this case firms in developing countries may be in a different life cycle (i.e. less mature) than American companies in the 1980s. For this reason, the estimations obtained for that period may not be

representative of the conditions of developing countries. The solution followed to avoid this problem is to employ estimations for American firms during the 1970s, which are expected to be more adequate to capture the specificities of developing countries, i.e. less mature industries (Rajan and Zingales, 1998, p. 565). Note that the only variation in the values of the EFD that is admitted is related to the life cycle of the firm. The corollary is that, for each sector, the technology is the same worldwide, at most it is just at different stages of maturity. However, these differences in the stage of technology vanish as firms move to a more mature stage of production, which is represented by the EFD values of American firms during the 1980s. From this picture there are different elements that deserve attention.

The first aspect to highlight is that, in our view, the idea that technology and techniques of production are stable is a limiting assumption. The technique employed in different countries may well change, not only because of the life cycle of the industry (Pasinetti, 1981). For example, rice production in Italy is scarcely comparable with rice production in India. As the technique in use is different, it is hard to believe that the EFD will be the same everywhere. It could be argued that the EFD is calculated from data from listed companies and given that these companies tend to be more advanced companies than unlisted ones, the difference between countries may be not that relevant. In other words, listed textiles (or any other industry) companies in developed countries will be more comparable to listed textiles companies in developing countries than non-listed and listed textiles companies in developing countries. If this was the case, the EFD estimation in different countries would be similar. However, the original construction of the EFD index does not differentiate between listed and non-listed companies. The EFD index is calculated for listed companies only, and it is meant to be a good feature of the industry's technological feature for both listed and unlisted firms. However, the difference of technology used by listed and unlisted firms could be particularly large, especially in developing countries.

A second point to stress is that the technique in use changes not only between countries, but also within the same country. Let's think to the evolution of agriculture. This sector has been traditionally viewed as labour intensive compared to other industries. However, the last century witnessed a radical change in the technique employed in agriculture (see Abercrombie (1972) for an analysis of mechanisation for the Latin American case). The technique of many crops, particularly in developed countries, are now considered to be capital intensive. In some crops/countries most of labourers have been substituted by machines that can be operated by a little amount of the labour force. Within this radical modification of the technique, it is hard to believe that the external financial needs (the

amount of capital in relation to cash flow) of agriculture have been maintained at a constant level. Another example might be represented by the process of robotization and automatisation of the economy and the impact that it is likely to have in the future on many industries. It is not our aim to discuss the different impact that this process might have on different industries. However, it is safe to suppose that this process will have different impacts on different industries. These modifications are expected to alter the use of fixed capital in industries and the ratio of cash flow to capital expenditure that could derive from it. These examples show that technologies may evolve radically. Technical change can alter the need in the quantity and type of capital goods needed in the production process, so that the EFD can change in time.

Another factor that can potentially influence the level of EFD as defined by Rajan and Zingales is outsourcing. As it is well known, outsourcing and Global Value Chains are a growing phenomenon of contemporary economies (Milberg and Winkler, 2013). The basic idea behind the rise of outsourcing is that companies realise a lower number of in-house operations than they used to do in the past, increasing the amount of intermediate goods involved in the production process. Outsourcing can take place within the home country of the company or in a third country (Contractor *et al.*, 2010, chap. 1). The most tangible outcome of this process is the increase of externalisation and the increase in the quota of indirect inputs. Since there are fewer inputs produced internally to the firm, it is to be expected that the process of outsourcing and the increase in intermediate inputs can have tangible effect on capital investment of the firms. Companies/industries that are more involved in the outsourcing process than others may have a bigger impact on the degree of capital intensity of their production processes. As this process deepens, it is to be expected that the capital expenditure in one industry is altered so that the EFD changes.

Other aspects exceed the role of technology in the determination of the level of EFD. One aspect to acknowledge is how market concentration relates to the representativeness of the EFD index at the industry level. As mentioned, the index is meant to grasp the external needs of finance of firms in the perfectly competitive firm. Rajan and Zingales are aware of the role that that big corporations may have in the determination of the index. For this reason, the EFD value for each industry is calculated as the median of firm-level values. By doing so, the authors intentionally reduce the role played by bigger corporations (that tend to have larger free cash flow), so that the industry value of the index tends to be smaller than that it would be if the mean of the industry (instead of the median) had been employed. While this procedure meets the objectives of the authors to reduce the role of big corporations, it can

be argued that it may not reflect properly the reality of some industries. Some industries may be heavily influenced by few big corporations with a sizeable market share (Autor, Katz and Dorn, 2017). Moreover, the assumption of perfectly competitive marker suffers from the fact that some industries are *structurally* very concentrated and include a very limited number of firms (e.g. Tobacco, Oil).

A further critique of the idea of invariability of the EFD index derives from a closer look to the original values. In the estimation of Rajan and Zingales (Table 4) there are four industries that have a value higher than one.[17] Given the formula of the EFD index (equation (1) above) and since capital expenditure can only be a strictly positive measure, firms can have values of the EFD index higher than one only in the case when their cash flow is negative. Since the EFD index is supposed to reflect invariable technological features of the industry, it is impossible that an industry can structurally record negative cash flow. At most, these values can be considered as temporary but do not reflect definitive stage of production. However, if this is the case it can be concluded that the original estimations from Rajan and Zingales do not express definitive and steady stages of production, so that the two assumptions of stability are violated.

Some other implications can be derived acknowledging the heterogeneity of results between estimations. Some estimates are substantially in line with those of Rajan and Zingales (Raddatz, 2006). Other authors, however, find that industries are mostly not dependent on external finance, as they record negative results (Kroszner, Laeven and Klingebiel, 2007). This difference with the original results might be due to the extension of the period of analysis to the nineties and the consequent change in technology or the influence of other factors that may have altered the levels of cash flows and capital expenditure. What has to be remarked here is that these variations suggests that the values of the EFD might vary in time, which contradicts the assumptions behind the construction of the index.

In light of these considerations there are different reasons, both theoretical and of empirical nature, to believe that the EFD index is not a universal measure that does not vary in time and space. The idea that the EFD index is able to capture unmodifiable technological reasons, seems to be too restrictive. It has been argued that technical change could well alter the proportions of cash flow to capital expenditure, modifying the EFD index. Note that this

[17] Radio, Office and computing, Plastic products and Drugs.

discussion on changes in technologies is independent from the assumption of a perfectly competitive market and frictionless financial environment. We must also add that, if the EFD index is a proxy of corporate net lending, it is not possible to claim that technological factors are the only determinant of the EFD index. In this case, the debate on the channels that determined the evolution of net lending becomes relevant for the determination of the EFD values.

To resume this discussion, it can be posited that:

Proposition 5. The assumptions of invariability across countries and in time of the EFD index are too restrictive from a theoretical and empirical perspective.

2.6. Summary

This chapter presented the relevant literature to which this study contributes and delineated the aspects that will be developed in the next chapters. Between 1990 and 2015 there has been a generalised increase in corporate net lending across G7 countries (Section 2.2) which is particularly accentuated in the new century. This evolution is the result of the simultaneous increase in corporate savings *and* the reduction in the rate of accumulation of capital. This shift changed the traditional role of net borrower of the corporate sector which became a net provider of funds to the economy as a whole. From this aggregate perspective, this research narrows its perspective, concentrating on firm-level data in order to:

a. Analyse the evolution of corporate net lending among listed NFC in G7 countries (*objective 1*).

Moreover, the thesis focuses on the causes behind the increase in corporate net lending. Despite growing number of contributions on the topic, different hypotheses explored so far to explain the rise in corporate net lending (e.g. precautionary, deleveraging, strategic motives) find little empirical support (Section 2.2.3). This implies that the causes behind the increase of net lending are still open to debate.

In order to expand the existing analysis, and considering *objective 2* of this research, we proposed and discussed, drawing from the relevant literature, two alternative factors that may have played a relevant role in the determination of net lending (Section 2.2.4):

b. *The process of financialisation*. The commitment of corporations towards the maximisation of shareholder value in the context of the maximisation of shareholders value orientation of the firms increases financial payouts and the share of firms' liquidity devoted to this purpose (*Proposition 1*).

Moreover, there exists a negative link between the process of financialisation (proxied by financial payouts) and capital expenditure (*Proposition 2*). Considering these propositions derived from the review of the relevant literature, a positive relationship is theorised between financialisation and corporate net lending.

c. *Functional income distribution*. A lower wage share creates the conditions to accumulate higher corporate savings and could lower aggregate investment, contributing to the rise of corporate net lending (*Proposition 3*).

The net lending measurement relates the internal funds of the firm (savings) in relation to fixed capital formation. It has been highlighted how this definition bears important similarities to the measure of EFD proposed by Rajan and Zingales (Section 2.5). Despite the similarity between the concepts of corporate net lending and EFD, there are no connections in the literature between these two concepts. This research addresses this gap, discussing the EFD index in relation to corporate net lending. This analysis is extremely relevant because corporate net lending and the EFD index are comparable concepts (*Proposition 4*). If the EFD index is a proxy of net lending it can also concluded that the factors that impact on net lending can also affect EFD. In this case, the EFD index cannot be analysed independently from the discussion on net lending.

Considering these aspects and *objective 3*, it is relevant to:

d. Analyse the theoretical and empirical differences between the measure of corporate net lending and the EFD index estimated by Rajan and Zingales.

Despite the similarity in the definitions of the concepts, the two measures are employed from very different perspectives. While corporate net borrowing/net lending is a measure that fluctuates in time, the EFD is assumed to be a proxy of invariant characteristics of the firms which are valid worldwide. This results from the fact that the EFD index rests on two foundational assumptions, namely the invariability of the index in space and in time. As it was illustrated in Section 2.5.2, these assumptions find little critical discussion in the existing literature. To fill this gap, these two assumptions were examined. The idea that technological features are invariable in time and across countries was challenged and it was maintained that there are different aspects that can influence the level of the index (e.g. outsourcing, automatization). Moreover, it has been shown that the limited existing attempts of replication of the index already exhibit a certain heterogeneity in outcome. From this appraisal, the assumptions of invariability across countries and in time of the EFD index can be regarded as too restrictive from the theoretical and empirical perspective (*Proposition 5*). In order to

contribute to the understanding of the dynamics of the industry values of the EFD index and in relation to *objective 4*, it will be relevant to:

e. Estimate the evolution of the EFD index among G7 countries in order to test the assumptions of invariability across countries and in time.

In conclusion, this chapter delineated the gaps and limitations in the existing literature and proposed alternative interpretations. From this critical assessment emerged five points (*a* to *e*) that address the objectives delineated in Chapter 1. The remaining of the thesis will analyse these aspects in detail.

CHAPTER 3. Methodology

3.1. Introduction

Chapter 2 discussed the theoretical channels and the relevant literature considered in this dissertation, including the key mechanisms through which financialisation and income distribution may impact on the level of corporate net lending as well as the relevance of the EFD index and its relation to corporate net lending.

This chapter deals with the research methodology employed in this dissertation, in order to explore how the role of financialisation and functional income distribution on corporate net lending can be tested empirically. To tackle these aspects, Section 3.2 briefly assesses the general approach that justifies the use of econometric analysis and describes the choice of the econometric model to test the role of financialisation and functional income distribution on the level of corporate net lending. This process involves the discussion of the variables of interests as well as the control variables employed to complement the econometric specification. Subsequently, Section 3.3 presents the process of construction of the database involving listed NFC among G7 countries which will be used in the empirical analysis. It describes the data sources as well as the steps of the data cleaning followed in order to obtain the final dataset employed. Section 3.4 summarises the main contributions of the chapter.

3.2. Econometric approach

According to Section 2.3 above, existing studies that have focused on the rise in net lending can be distinguished by their type of empirical approach and have been broadly classified into two main groups. The first group of works employs descriptive analysis to characterise the evolution of variables that may explain the rise of net lending. The second group of contributions is based on econometrics and it aims at quantifying the impact that different factors have had on the rise of net lending. The quantitative analysis employed in this research draws from this latter group of contributions. Before addressing the specific econometric model employed in this dissertation, it is necessary to discuss the econometric technique and its importance and some limits for applied research.

The economics and finance studies widely rely on econometrics[18] and nowadays regression analysis represents the most common method in empirical investigations within the discipline (Pinto, 2011). One of the main advantages of the regression technique is that it provides a concise quantification of the correlation that one or more variables have with a certain variable of interest.

The limitations of econometrics are, however, open to debate. Some economists argue that econometrics allows one to grasp empirical regularities and, in some cases, go even further, claiming that these regularities can be potentially converted into economic laws. For example, Klein states that:

> Econometrics had its origin in the recognition of empirical regularities and the systematic attempt to generalize these regularities into "laws" of economics. In a broad sense, the use of such "laws" is to make predictions – about what might have or what will come to pass. Econometrics should give a base for economic prediction beyond experience if it is to be useful. In this broad sense it may be called the science of economic prediction (Klein, 1971, pp. 416–417).

This deterministic view of "laws" in economics (often using econometrics) has been widely contested by different scholars. For example, Moosa (2017, chap. 4) argues that most "laws in economics" have proven to lack empirical validation.

On more theoretical grounds, the discussion is not restricted to the use of econometrics and is more broadly related to the distinction between different approaches to economic methodology. In this respect, some scholars distinguish between economic analysis based on "open" and "closed" systems. Considering the economy as an "open" or a "closed" system entails important consequences for economic analysis. If the economy is believed to be a closed system there are regularities between events such that whenever an event *x* takes place, the event *y* follows (Fleetwood, 2017, p. 41). According to the closed system view, the relevant mechanisms can be isolated, observed and estimated by identifying a causal nexus between the variables (Morgan, 2016, p. 21).[19] Conversely, open economic systems imply that the economy is continuously influenced by new factors that impedes the

[18] There are different definitions of econometrics. Some authors refer to econometrics as "the measurement of quantities relevant to economic analysis" (Martins, 2016, p. 222). Nowadays, the most common usage (employed here) of the term refers to regression analysis, where the dependent variable (i.e. the variable to be explained) is regressed over one or more independent variables (regressors) in order to estimate elasticity coefficients that quantify the impact that the regressors have on the dependent variable (Downward, 2016).

[19] For a detailed overview of the definitions of "closed system" and a discussion on open vs. closed systems see Mearman (2006).

generalisation of the conclusions drawn in specific circumstances (Chick, 1998). Under this perspective, econometrics cannot be thought of as a tool to test universal laws, as argued by Klein (1971). This point is re-affirmed by Pinto, who maintains that the "vision of establishing general laws should be completely rejected as a goal of econometrics, as this purpose seems inappropriate given the nature of economic laws in which 'natural' justifications in the social sciences cannot resist the agency human" (Pinto, 2011, p. 438). This view does not necessarily imply the rejection of econometrics but the reconsideration of its utility. If the economy is viewed as an open system, it is not possible to draw universal laws from regularities experienced at a specific point in time and space.

To define the empirical strategy followed in this thesis, we find it useful to refer to the contributions of Downward and Mearman (2002, 2007) and Downward et al. (2002). These authors provide relevant insights about the role of quantitative analysis and econometrics in relation to open systems. In this respect, they criticise the inflexibility and determinism offered by some econometric studies, but at the same time argue in favour of the use of quantitative methods under certain circumstances. Trying to find a synthesis between different views among non-mainstream economists, these authors propose the combination of theoretical, descriptive and quantitative methods for economic analysis. In the authors' words:

> from an operational perspective, […] this [approach] suggests that various empirical insights should be triangulated. […] [W]hile descriptive and historical analysis might themselves be suggestive of the causal mechanisms, the effects of their action can be assessed, and hence the purported causal mechanism supported, with reference to more quantitative analysis (Downward and Mearman, 2002, p. 409).

From this perspective, statistical tools are not implemented to find evidence from which to derive universal laws, but rather are considered as instruments to validate theoretical claims based on empirical regularities (Downward, Finch and Ramsay, 2002, p. 494). These regularities do not necessarily represent elements to derive general laws capable of predicting future economic outcome. What is relevant here is that this approach admits the use of different analytical methods in economic analysis. Quantitative analysis is a tool to assess empirical regularities derived from the theoretical discussion presented in Chapter 2. Consistent with this view, the ensuing chapters deal with descriptive and econometric analysis. In particular, they provide descriptive evidence about the trends of net lending in

the sample of firms and countries and they establish relationship between variables (Chapter 4). These relationships are then tested by applying econometrics (Chapter 5).

3.2.1. Econometric design

In order to design the econometric model, a starting point is the existing studies on firm-level analysis of net lending (Brufman, Martinez and Pérez Artica, 2013; Dao and Maggi, 2018; Saibene, 2018). As mentioned in Chapter 2, the interest lies in testing the relationship between the dependent variables and the variables of interests. In the case of this research, these variables are meant to capture the two channels of this research, the process of financialisation and functional income distribution. The analysis is performed using firm-level panel data. The database is composed by yearly observations for each one of the firms included in the dataset (see Section 3.2.2 below for details).

Before detailing the econometric model employed in this research it is worth considering the general specification of the regression. This can be expressed as:[20]

$$NL_{it} = \alpha_i + x'_{it}\beta + v'_{it}\gamma + \varepsilon_{it} \quad (3)$$

Where NL represents net lending.[21] The subscript *i* identifies the individual firm while the subscript *t* the period (year) of observation. The x term is the *k x 1* vector of the variables of interest, v is the vector of *k x 1* of the control variables whilst β and γ are, respectively, the regression coefficients for the variables of interest and control variable. The error term ε_{it} captures all the variance that is not captured by the other regressors.

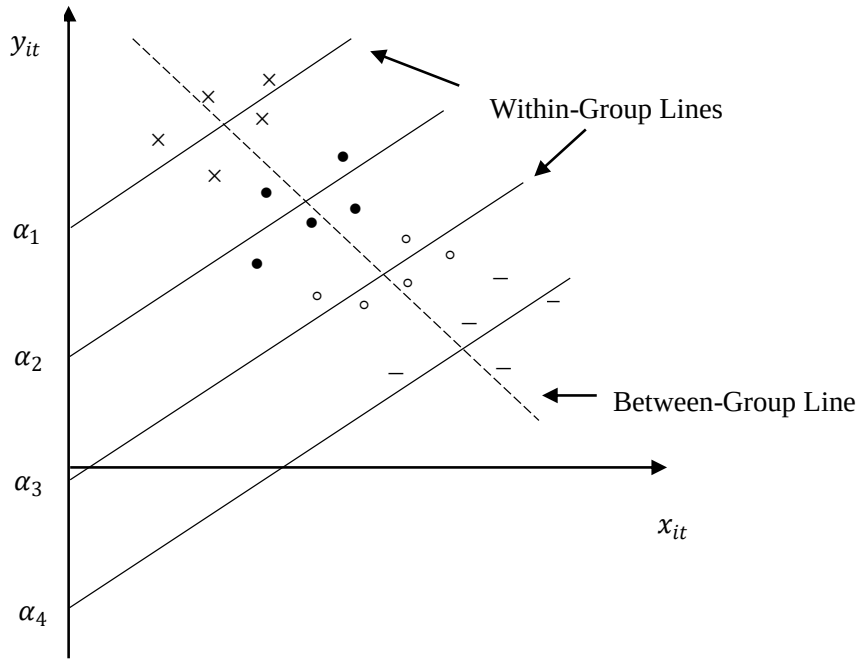
Equation (3) includes the term α_i, that is the vector (i *x 1*) of the time invariant effects component of the firms. Note that α_i is the only time invariant component of the regression equation (3). These α_i elements represent nuisance parameters that do not have interest in the analysis, but their omission would prevent the correct estimation of the β coefficients of interest. This is due to individual-specific effects that may grasp unobserved heterogeneity that is correlated with the regressors (Cameron and Trivedi, 2005, p. 726). The inclusion of these time invariant effects gives the name to the estimator, i.e. fixed-effect estimator (also known as a within-group estimator).

The importance of including the fixed-effects in the regression, to obtain unbiased estimations of the β coefficients, can be grasped by observing Figure 2 (adapted from

[20] The superscript $'$ indicates vector transposition.
[21] Or net borrowing, in case the value is negative.

Arellano, 2004) that shows the relation between two variables (*x* and *y*) in a sample of four firms *i* where, for each firm, there is a positive relation between the two variables. However, standard Ordinary Least Square (OLS) cross-sectional estimations would not be able to capture the specificity of each one of the firms. This is because standard OLS estimations do not distinguish between units of analysis in the panel data, so that the β coefficient is not estimated *within* each unit of analysis. This is reflected by the negative OLS between-line estimator (dashed line in the figure) deriving from the standard cross-sectional analysis. The within-group estimator, on the contrary, rightly captures the positive relationship between *x* and *y* (upward sloped lines in the figure). The fixed-effect of each firm is represented by the different intercepts α_i for each one of the lines of the within estimator. In this case, the different α_i coefficients estimate the firm-level specific effect of unobserved heterogeneity between firms.

Figure 2. Within-group and between-group estimations. Each marker represents observations for a different unit (firm).



Source: Own elaboration based on Arellano (2004, fig. 3.1).

Fixed-effects are not the only type of estimators performed with panel data. In this respect, a common point of discussion in the literature is to focus on the choice between fixed-effects and random-effects estimators. Although the standard practice in many econometrics studies is to reduce the choice between the two types of estimators to a purely empirical issue (validated through the implementation of the so-called Hausmann test), the choice of the

econometric technique of estimation embeds relevant theoretical assumptions about the model (Baltagi, 2005).

According to Wooldridge (2012, pp. 495–496), one important difference between fixed-effects and random-effects is that the former allows arbitrary correlation between the dependent variable and the unobserved fixed-effect. This contributes to make fixed-effects models more common than random-effect models. From the perspective of this study, it is reasonable to assume that each firm differs in relation to the level of net lending. These firm-specific characteristics imply that each unit of analysis will have a different intercept, as represented by the α_i components.

The preference towards fixed-effect regressions also applies to other studies on net lending at the firm-level, that all implement this type of estimator (Brufman, Martinez and Pérez Artica, 2013; Dao and Maggi, 2018; Saibene, 2018). In light of this discussion, fixed-effects are preferred over random-effects.

Having now discussed the rationale behind choosing a fixed-effects model, it is possible to present the econometric model more explicitly, referring to the area of inquiry of this research. Drawing from the existent literature on net lending at the firm-level analysis, the baseline specification can be expressed as:

$$NL\_TA_{it} = \beta_1 F_{it} + \beta_2 ID_{it} + \gamma X_{it} + \alpha_i + \rho_t + \varepsilon_{it} \qquad (4)$$

Where NL_TA_{it} is the value of net lending of firm *i* in year *t* expressed as ratio of total assets. F_{it} and ID_{it} capture, respectively, a set of variables of interest connected to financialisation and to income distribution at the individual firm-level in year *t*, while X_{it} is a vector of control variables. The term α_i represents the firm-related fixed-effect coefficient discussed above and ρ_t is the annual fixed-effect which is thought to capture effects common to all firms such as business cycles. Finally, ε_{it} is the residual component.

3.2.2. Variable definitions

This subsection describes the construction of the dependent variable (*NL_TA*), the main variables of interests (*F* and *ID*) and the control variables (*X*) employed in the econometric analysis.

3.2.2.1. Dependent variable definition: Corporate net lending at the firm-level

Section 2.2 of the literature review shows how corporate net lending is defined at the aggregate level. Given the firm-level inquiry of this research it is necessary to define the way

in which net lending is computed for each firm and year. This is not as straightforward as it is in the case of aggregate measures, as there is no established consensus on the definition of net lending at the firm-level which concerns especially the definition of corporate savings. A common definition of corporate savings employed in studies at the firm-level studies (Brufman, Martinez and Pérez Artica, 2013; Dao and Maggi, 2018; Saibene, 2018) is the following:

$$Savings = Net\ Income + D\&A - \ Dividends \tag{5}$$

where $D\&A$ refers to depreciation and amortisation and $Dividends$ represents dividend payments realised by the firm. Different from these authors, the definition of corporate savings that will be adopted in our empirical analysis does not exclude dividends from net lending and *D&A*, so that:

$$Savings = Net\ Income + D\&A \tag{6}$$

The reasons that sustain this formulation lie in the treatment given to financial payouts (represented by dividends payments and share repurchases) in the framework of analysis followed in this research. Grouping together dividends and share repurchases responds to specific needs of this research. As stressed in Juach (2012), dividend payments and share repurchases can be viewed as alternative ways of returning savings to shareholders. This is coherent with the already mentioned (Section 2.4.1) substitution hypothesis (Grullon and Michaely, 2002). According to this hypothesis firms can alter the use of dividends and buybacks as substitutes instruments that satisfy similar needs. Since companies can substitute dividends for share repurchases, both instruments need to be considered as complementary sides of the same coin. Similarly, Gruber and Kamin argue that it would be inconsistent to let the dividends affect the measure of savings (and net lending) since "a change in preference for buybacks vs. dividends would somewhat arbitrarily increase measured corporate net lending. Grouping dividends and buybacks into 'payouts' avoids this arbitrary distinction" (Gruber and Kamin, 2015, p. 8). This is also reflected in the financialisation literature that groups together share repurchases and dividends as constitutive elements of the financialisation narrative (Milberg, 2008). Therefore, it is our intention to determine savings *before* share repurchases and dividends payment are realised, as dividend payments and share repurchases are two representative elements of the same process, financialisation. For these reasons, dividend payments are not discounted from the calculation of corporate savings.

In the case of capital accumulation, the definition of investment is more straightforward. Investment is defined here as the addition to fixed assets of the firms. Having defined corporate savings and investment, it is possible to calculate net lending at the firm-level by subtracting investment from savings:

$$NL = Savings - Fixed\ Capital\ Investment \quad (7)$$

This is the definition of corporate net lending that will be used in the empirical analysis of the thesis. In the regression analysis net lending is expressed in terms of total assets. In this case it is shortened as *NL_TA*.

3.2.2.2. Variables of interest

Financialisation variables

The first group of variables of interest concerns the process of financialisation (F in equation (4) above). In Chapter 2 it was argued that it is possible to establish a link between the process of finacialisation and corporate net lending. It was also stated that is not easy to find a proxy of financialisation (Stockhammer, 2004). In this respect, a common procedure is to use financial payouts (dividends and share repurchases) as a proxy of financialisation (Milberg, 2008; Lazonick, 2010). This practice is not a purely empirical convention but is rooted in the theoretical mechanisms connected with the process of financialisation. The theoretical discussion in Chapter 2 highlighted multiple interrelated mechanisms through which the process of financialisation is reflected in the growth of financial payouts: for example, the alignment of manager and shareholders' interests that is reflected via the increase of stock-options payments to corporate CEOs (Froud *et al.*, 2006), while the pursuit of shareholders' satisfaction creates incentives to increase financial payouts (Hein and van Treeck, 2010). This further relates to the practice of manipulation of shares prices, especially through share repurchases, that has been emphasised by other authors (Lazonick, 2015, 2017; Almeida, Fos and Kronlund, 2016). As a result of these several mechanisms, under the regime of financialisation it can be argued that financial payouts are expected to increase.

Consistent with this perspective, the first variable of interest is total payouts over total assets (*PAYOUTS)* which is equal to the sum of dividends and share repurchases at the firm-level. This measure reflects a common practice in economic and financial studies to group together dividends and share repurchases into financial payouts (Brav et al., 2005; Haw et al., 2011; Floyd et al., 2015) and allows one to take into account the already discussed substitution hypothesis (Grullon and Michaely, 2002). The second and third variables of interest are

represented by the decomposition of total payouts into, respectively, dividends paid out (*DIVIDENDS)* and share repurchases (*BUYBACKS*) over total assets. This allows one to grasp the specific role played by each one of these variables in influencing the level of net lending. According to the financialisation hypothesis, all these variables are expected to have a positive sign, since the increase in financialisation has an overall positive effect on corporate net lending through the positive impact on the level of liquidity held by the firms and the negative impact on physical investment.

Functional income distribution variables

The second group of variables of interest focuses on functional income distribution (*ID*). Income distribution concerns the division of income between capital owners and labour. The empirical calculation of this measure, however, incurs some complications. At the country level, the labour share can be defined as the ratio of total wage compensation over a measure of output of the economy, GDP or national income (Luebker, 2003). At this level analysis, one of the main obstacles is the treatment of autonomous workers in the computation of factor shares.[22] At the firm-level the main factor to consider in the construction of the distributive variables is the way in which the measures of net output and labour compensation are estimated. While the identification of labour compensation is potentially more straightforward when working with firm-level data, the appropriate measure of output of the firm is less obvious to determine. In order to deal with these issues, four distinct income distribution variables are employed.

The first one is the ratio of wages at the firm-level over total assets (*W_TA*). The advantage of this variable is that its computation involves fewer variables which allows to increase the number of observations. In strict terms, total assets are not a measure of net output of the firm as it should be in the case of income distribution variables. However, this variable provides a magnitude of the weight of labour costs in relation to total assets, that are the resources held by the corporation. The second variable is the ratio of wages over sales (*W_SALES*). This measure links workers remuneration with the most tangible indicator of production of the firm, i.e. the value of sales (or net revenues). Similarly to *W_TA*, there are only two components involved in the creation of the variable (wages and sales), which lowers the risk of missing values problems. The third measure of functional income

[22] The unadjusted labour share does not take into account the income of the self-employed. In order to deal with this issue, different strategies have been developed to adjust the computation of the labour share. A common procedure is to attribute to self-employed the same wage as wage earners (for a detailed discussion see Gollin, 2002; Arpaia et al., 2009).

distribution at the firm-level is the ratio of wages to value added, *W_VA*. This measure is one of the most common measures of functional income distribution that can be found in the firm-level (Autor, Katz and Dorn, 2017; Houngbonon and Da Costa, 2017). Following Cirillo et al. (2018), value added is defined as the difference between sales and costs of goods sold plus the change in inventories. However, this variable can create operational problems, since the presence of missing values for any of the addends that compose *W_VA* would impede the computation of the variable of interest, with the consequence of a relevant loss of information (see Section 3.3 for details on missing values in the database).

An important aspect to consider is that firm-level data are not always available in the Worldscope database (see Table 25 of the Appendix for the availability of wage variables for each country and year, and Section 3.3 below for a detailed discussion). Given the limitation of data on wages for some non-European countries in some years, the fourth income distribution variable of interest is the labour share at the country level is used (*LABSHARE*). This is the only variable in the model that is not created at the firm-level. On the one hand, this can potentially represent a limitation for the analysis as it does not allow a focus on firm-specific characteristics. On the other hand, however, it allows an evaluation of the aggregate macroeconomic effects of the wage share on the level of net lending. In other words, it allows one to impute the effect of the income distribution at the country level on the firm-specific level of net lending, after controlling for other relevant factors at the firm-level.

In light of the discussion in Section 2.4.2, it is to be expected that all the income distribution variables are negatively associated to the level of net lending.

3.2.2.3. Control variables

As it is widely acknowledged, the omission of relevant factors from the list of regressors in every econometric model (beyond the variables of interest) would lead to biased results of the coefficients of the variables of interest (Chamberlain, 1978; Angrist and Pischke, 2009). A first way to correct omitted variables bias in panel data analysis is to include fixed-effects in the regression model (Hsu, Tian and Xu, 2014; Igan, Kutan and Mirzaei, 2016). These effects account for individual-specific characteristics that could impact on the dependent variable. The term α_i (firm fixed-effect) in the econometric model (4) responds to this need, as it smooths firm-level time-invariant characteristics. In addition to firm-specific fixed-effects, ρ_t (time fixed-effect) controls for temporal oscillation in net lending due to the business cycle.

In order to avoid omitted variables and exploit heterogeneity a vector of control variables is included into the regression model (vector *X* in the model specification (4) above). Most of the following variables draw from the existing econometric studies on corporate net lending (and, more generally, firm-level analysis). In some cases, the control variables listed below do not derive from the existing literature on net lending. However, they are included in the econometric specification because it will be argued that they can potentially affect the level of net lending.

- *CURRLIAB* and *LEVERAGE* represent, respectively, current and total liabilities of the firm. These variables are included in different econometric specifications on corporate net lending (Brufman, Martinez and Pérez Artica, 2013; Dao and Maggi, 2018). The rationale behind their inclusion is that higher indebtedness levels are expected to have a negative relationship with net lending, since debt repayment reduces the amount of savings of the firm. Moreover, these variables allow control for the deleveraging motive discussed by other authors (Cardarelli and Ueda, 2006; Saibene, 2018). According to this argument, more leveraged firms may increase corporate net lending in order to reduce their leverage. An alternative interpretation of these parameters may be that more leveraged firms will have higher debt expenses, which reduces the amount of savings of the corporate sector and therefore have a negative impact on the level of net lending.
- *SALES* represents the ratio of firm's sales (net revenues) over total assets. Sales is chosen as a proxy of firms' size because this variable is often employed in rankings on firms' size (e.g. Dao and Maggi, 2018). It was preferred over number of staff (another traditional measure of companies' size) because the database does not allow one to distinguish between full-time and part-time workers and because of the higher availability of data. Moreover, sales are commonly employed also in other studies to proxy firms size (e.g. Grullon, Larkin and Michaely, 2019). Since it is expressed as the ratio of total assets, *SALES* allows to control for peaks in net revenues of the firm that may influence positively the level of savings.
- *R&D* is Research and Development expenditure of the firm. The inclusion of this variable responds to different needs. As in Dao and Maggi (2018), this variable is included to establish whether firms save more in order to finance their innovation expenditure in *R&D*. In addition to this argument, this measure can also be considered a proxy of intangible capital (Haskel and Stian, 2017; Dottling, Ladika and Perotti, 2018). There is a growing number of literature that focuses on the rise of intangible capital (see Shipman, 2015). This aspect is especially relevant for the

analysis of net lending as some authors argue that the stagnation of physical capital may be partially explained by the substitution of intangible capital (Orhangazi, 2018). For this reason, it is important to control for the possible role played by this factor. Accordingly, *R&D* is expected to reduce the amount of savings and net lending.

- *TOBINQ* is Tobin's Q of the firmthat reflects the market to book value of the firm. The formulation of this variable is that proposed in Chung and Pritt's (1994). These authors define Tobin's Q as the product of firm's share price and outstanding shares plus total liabilities, all divided by total assets. This measure has the advantage that its computation is less dispendious (in terms of the number of data needed to obtain it) compared to other standard definitions of Tobin's Q and does not involve any significant loss of information (Lindenberg and Ross, 1981). For these reasons, it is widely employed in the literature (e.g. Graham, 2000; Carter et al., 2003; Coles et al., 2008; Tori and Onaran, 2018).
- *LIQNEEDS* is the ratio of inventories over sales and represents a proxy of liquidity needs (Raddatz, 2006). Raddatz develops this measure of liquidity needs of the firm to capture the liquidity requirements of the firms. Measures of liquidity needs are usually not considered by the literature on corporate net lending. However, some may argue that net lending is the result of the increased requirements for liquidity that firms need to realise their standard productive operations. If this increase happened and was significant it can be posited that this measure has a significant and positive impact on the level of net lending.

In conclusion of this section, all variables employed in the regression are summarised in Table 8. Note that all variables of the model discussed in this section are normalized by total assets unless specified.[23]

[23] The full list of variables' codes can be found in Table 26 in the Appendix.

Table 8. List of independent variables.

	Variable's label	*Description*	*Expected sign*
Financialisation Variables (*F*)	*PAYOUTS*	Dividends + share repurchases	+
	DIV	Dividends over total assets	+
	BUY	Share repurchases over total assets	+
Income distribution Variables (*ID*)	*W_TA*	Staff costs	-
	W_SALES	Staff costs over sales	-
	W_VA	Staff costs over value added	-
	LABSHARE	Wage share at the country level	-
Control variables (*X*)	*LEVERAGE*	Total liabilities	
	CURRLIAB	Current liabilities	
	SALES	Sales	
	R&D	*R&D* expenditure	
	TOBINQ	(Market share price*common share outstanding + total liabilities)/total assets	
	LIQNEEDS	Stock of inventories over sales	

Source: Own elaboration
Note: All variables are normalized by total assets unless specified.

3.3. Data collection

This section describes the process of construction of the dataset employed in the empirical analysis. As mentioned, firm-level data has been downloaded from the Worldscope database. This database reports balance sheet information for all listed companies in the world and it is widely used in firm-level studies (e.g. Raddatz, 2006; Kroszner, Laeven, & Klingebiel, 2007; Beck et al., 2008; Von Eije & Megginson, 2008 among others).

The fact that this database provides information regarding listed corporations only may be regarded as a limitation for the analysis as it does not provide information about all firms. Undoubtedly, it would be ideal to have detailed data that included unlisted companies. However, this would be infeasible given the impossibility of accessing to firm-level data with the degree of detail required in this study. Moreover, some authors (Galizia and Steinberger, 2003) note that listed firms tend to have higher levels of net lending compared to unlisted firms. This implies that listed companies are the main actors determining the rise of net lending.

The data collected includes both active and inactive firms. This last group of firms refers to companies that, at present, are not in the database for different reasons, such as bankruptcy

or mergers and acquisition. Since firms enter and exit the database, the final database is an unbalanced panel of firms.

After downloading the variables from Worldscope, we performed a number of operations of data cleaning. Since this study focuses on NFC, financial corporations were excluded from the dataset (SIC 1987 codes 6000-679/)[24]. This reflects a common practice in economic and financial (Davis, 2018; Falato et al., 2013; Milberg, 2008; among others) as well as in the corporate net lending literature (André *et al.*, 2007; Brufman, Martinez and Pérez Artica, 2013; Gruber and Kamin, 2016). In addition to manufacturing (SIC codes 2000-3999), the final database includes primary (0700-0980), extractive (1000-1499), construction companies (1500-1999), utilities (4000-4999), wholesale (5000-5199) and retail trade (5200-5999).

Another aspect to consider when working with Worldscope data is that, for the same firm, the availability of data can change depending on the variable under consideration. Some variables have longer series than other variables, that can be shorter in coverage or display missing values. This implies that, for the same firm, the years with available information may be different depending on the variable under consideration. For example, for firm *i*, availability on net income could be for 10 years while *D&A* data is available only for 5 years. This has important implications for the empirical analysis. For the majority of the variables it is not possible to extrapolate values in cases of a missing values, which implies that a missing value corresponds to a loss of information.

For other variables (*R&D*, dividends and share repurchases), the common practice in the literature is to consider missing values as zero (Dao and Maggi, 2018, p. 22). Accordingly, missing values were substituted for zero values in the case of *R&D*, dividends and share repurchases. In addition, as it is common when working with similar data (Tori and Onaran, 2018a), observations with negative values for the following variables were omitted from the analysis: sales, capital expenditure, current and total liabilities, *R&D*, dividends, wages and inventories stock.

Moreover, we winsorized observations at the upper and lower 5% of the distribution to deal with presence of outliers. Finally, firms with less than four consecutive years of observations were omitted from the econometric analysis to guarantee that all the firms experience a common minimum period of permanence in the sample. These procedures are common in

[24] Worldscope's industry classification employs the SIC 1987 categories. As will be discussed in Chapter 6, this aspect needs to be taken into account when comparing findings with other studies.

the literature on firm behaviour and with firm-level data (e.g. Haw et al., 2011; Kusnadi & Wei, 2011).

To give a glimpse of the different availability of data according to the measure, Table 9 shows the number of observations per variable. Most of the variables involved in the econometric regressions have between 200,000 and 250,000 observations. As mentioned in the previous subsection, income distribution variables are those with the lowest number of observations. This is partially counterbalanced by the inclusion of the labour share at the country level (*LABSHARE*). Being the only country-level variable, it is possible to have values for all the observations in the dataset. The variability in the numbers of observations reflects the fact that not all variables have the same availability.

Table 9. Number of observations per variable (1990-2015).

Variable	N.	Variable	N.	Variable	N.
NL	202,798	*TOBIN_Q*	202,669	*WAGES_TA*	64,288
CURLAB	231,969	*LIQNEEDS*	221,758	*W_SALES*	55,515
LEVERAGE	235,320	*PAYOUTS*	250,076	*WAGES_VA*	21,079
SALES	249,002	*DIV*	250,076	*LABSHARE*	250,076
R&D	250,076	*BUY*	250,076		

Source: Own elaboration based on Worldscope data.

An important aspect to stress is that the periods covered for the empirical analysis change between the econometric analysis about the rise of net lending described so far and the replication of the EFD index (that will be developed Chapter 6). The analysis of the rise of net lending runs from 1990 to 2015. This period corresponds to the generalised shift from net borrowing to net lender positions (see Table 2 in Chapter 4). Conversely, the analysis on the EFD index also includes the 1980s, so that the total period of analysis is of 25 years, from 1980 to 2015. The extension to the 1980s of the calculation of the EFD index is necessary to compare these new estimations with the original calculations of Rajan and Zingales (see Chapter 6). The fact that the analysis of the EFD index embraces a period of 35 years (1980-2015) allows to test the hypothesis of invariability in time of the index over a consistent period of time.

The inclusion of the 1980s in the analysis would not be possible for the econometric analysis. This is because the replication of the EFD index involves a lower number of variables for the construction of the EFD index compared to the number of variables needed in the estimation of regression (4). The lower number of variables needed in the replication of the

EFD index compared to that involved in the econometric estimation reduces the possibility of missing values that would affect the reliability of the analysis.

3.4. Summary

This chapter has outlined the empirical methodology designed to assess the effect of financialisation and income distribution on the level of corporate net lending. In light of the nature of the dataset and the panel-data econometric specification, a fixed-effects model was chosen for the regression analysis. This choice finds further support in the existing literature on net lending (e.g. Brufman, Martinez and Pérez Artica, 2013; Dao and Maggi, 2018; Saibene, 2018) which widely relies this onestimation strategy.

This chapter also discussed the variables employed in the econometric model. The definition of net lending used in this research differs from that which is usually followed in other studies. This difference is justified by one of the objectives of this research (the role played by dividends and buybacks in the rise of net lending), by the substitution hypothesis (Grullon and Michaely, 2002) and by the treatment given to financial payouts by financialisation scholars (e.g. Milberg, 2008). This chapter also identified the variables used to grasp the process of financialisation and functional income distribution. For each factor there are, respectively, three and four variables of interest that will be included in the econometric tests. Subsequently, the control variables of the model were presented. Most of these variables are derived from the existing research on corporate net lending. In some cases (*LIQNEEDS* and, to a lesser extent *R&D*), control variables were included to control for possible aspect that can have influenced the level of net lending but have not been implemented so far.

After detailing the theoretical rationale that guided the design of the econometric strategy, Section 3.3 described the steps followed in the construction of the dataset utilised in the analysis, from the download of relevant information to the process of data cleaning. This process reflects standard practices in the literature such as winsorizing observations to deal with outliers and the omission of implausible variables (i.e. negative values for variables such as sales, R&D, total assets etc.).

The next chapters present the empirical results carried out with the dataset presented here. The analysis will provide descriptive trends of the variables of interest (Chapter 4) and then complement it with quantitative analysis (Chapter 5).

CHAPTER 4. Descriptive analysis and stylised facts

4.1. Introduction

Following the debate on the rise of corporate net lending (Chapter 2) and the methodological discussion concerning this research (Chapter 3), this chapter presents descriptive figures directly derived from our dataset. The aim is to illustrate the evolution of corporate net lending among the sample of firms. This analysis is required to meet *objective 1* of this research, i.e. the characterisation of the evolution of net lending among listed NFC in G7 countries. Moreover, it also provides descriptive evidence of the link between the process of financialisation and functional income distribution with net lending (*objective 2*).

Following this introduction, the chapter is organised into four additional parts. Section 4.2 deals with corporate net lending among listed NFC among G7 countries. It discusses the availability of data and the distribution of observations among industries. Subsequently, it presents the trends in corporate savings, investment and net lending in each G7 country, with accurate figures on the quantitative evolution of these indicators. Finally, it looks in more detail at the dataset, linking the emergence of corporate net lending with other characteristics of the firms, such as geographical distribution and their size. The following sections (4.3 and 4.4) provide a closer look at financial payouts and functional income distributions. These sections show the trend of the variables of interest introduced in the methodology chapter and offers preliminary evidence of their link with corporate net lending. Section 5 summarises the salient aspects of the chapter that are relevant for the subsequent econometric analysis.

4.2. Net lending among listed NFC

The description of the evolution of corporate net lending within the sample of firms is a crucial step in the research, since it allows us to characterise the dataset at our disposal that will be employed to assess the change of net lending among listed NFC of G7 countries. Before addressing quantitative figures on the volume of net lending, it is necessary to look at the availability of data within the database. Table 9 in the methodology chapter showed that the availability of observations for each variable employed in the econometric analysis varies considerably. It is now relevant to present disaggregated data (for each country and year) regarding the number of observations (i.e. the number of firms in each year) of corporate net lending at the firm-level. This step is important because, given the imbalanced nature of the panel, firms enter and exit the sample, implying a varying number of

observations in each year. Table 10 illustrates the number of firms by year and country for which the observations on net lending are available.

From the table it appears that the number of firms varies considerably across countries and year. In all G7 countries there is a considerable increase in the number of firms until the Global Financial Crisis of 2007-8, especially since the second half of the 1990s. Between 1990 and 2007 the number of firms multiplies by four, reaching more than 10,000 simultaneous units in total. This growth can be imputed to generalised economic growth and to the increased tendency of firms to join the stock market recorded during this period. After the crisis, the number of listed firms decreased by more than three thousand units in less than a decade. This inverse-U-shaped curve is found among all countries of the sample. It can be assumed that this declining trend is the outcome of at least three processes (Govindarajan *et al.*, 2018). First, the last economic crisis led some firms into bankruptcy. Second, mergers and acquisitions tend to diminish the number of firms in the sample, which can explain part of the reduction recorded since the 2000s. Third, there was a decrease in the number of initial public offerings (IPO) experienced in developed countries.

With respect to the geographical distribution of the firms in the sample, the US record the highest number of observations during the period. The second country in terms of number of firms is Japan, followed by Canada and the UK. Continental European countries record the lowest number of observations, between 4 and 9 thousand over the whole period. This heterogeneity has relevant implications in terms of empirical analysis. For this reason, the empirical analysis performed below often distinguishes between countries rather than displaying aggregate figures.

An additional aspect of interest is the distribution of firms across industries. To tackle this point, listed NFC were classified into six different industries derived from the division provided by the SIC 1987 classification: Primary, Mining, Construction, Manufacturing, Utilities and Transportation, Wholesale and Retail Trade. As it can be appreciated in Table 11, more than half of the observations belong to firms in the Manufacturing industry, followed by Wholesale and Retail Trade, Mining and Utilities and Transportation. The sectoral distribution of firms follows a similar pattern in most of the countries. This reduces the risk that country specific results could be driven by a different industry distribution of the firms in the sample.

Table 10. Number of observations (firms) by year and country.

Year	US	UK	Germany	Italy	France	Japan	Canada	Total
1990	1,565	810	303	118	182	253	270	3,501
1991	1,748	842	331	125	196	258	285	3,785
1992	1,872	857	351	124	205	282	291	3,982
1993	2,010	880	350	119	222	311	306	4,198
1994	2,700	884	324	123	220	332	309	4,892
1995	2,951	870	354	125	232	325	337	5,194
1996	3,267	846	378	126	229	1,043	356	6,245
1997	3,599	816	384	118	226	1,109	362	6,614
1998	4,311	855	387	123	230	1,094	555	7,555
1999	4,261	786	379	130	230	1,100	653	7,539
2000	4,090	784	344	140	317	1,989	646	8,310
2001	4,012	834	323	148	347	2,755	697	9,116
2002	3,844	855	372	174	371	2,836	849	9,301
2003	3,743	879	410	173	398	2,914	973	9,490
2004	3,684	907	422	182	387	2,951	1,055	9,588
2005	3,752	951	418	180	404	2,979	1,720	10,404
2006	3,692	959	420	190	389	2,949	1,832	10,431
2007	3,563	930	427	190	385	2,931	2,010	10,436
2008	3,403	884	426	189	380	2,855	2,003	10,140
2009	3,275	833	400	189	371	2,793	1,949	9,810
2010	3,172	783	381	185	340	2,737	2,012	9,610
2011	3,105	779	370	180	354	2,693	2,003	9,484
2012	3,051	735	353	179	346	2,660	1,801	9,125
2013	2,858	700	338	171	333	2,610	1,516	8,526
2014	2,742	651	324	162	330	2,565	1,236	8,010
2015	2,523	604	299	149	306	2,550	1,081	7,512
Total	82,793	21,514	9,568	4,012	7,930	49,874	27,107	202,798

Source: Author's calculations based on Worldscope database.

Within this context, the most relevant exception is represented by Canada. In this country, 62% of the observations are constituted by industries belonging to the Mining industry. This feature is closely related to the importance of Mining for the Canadian economy. In 2015 the GDP generated by the Mining sector was 70% of that generated by the whole Manufacturing sector (Mining Association of Canada, 2018, fig. 1). Moreover, this predominance is persistent also in the international sphere. Among the top 40 Mining companies in the world, 6 of them were Canadian, which makes Canada the most represented country after China in this list (with 10 Mining companies among the top 40) (PWC, 2018, p. 22). To have an idea of the predominance of the Mining industry in Canada in comparison with other G7 countries, consider that the second country with the highest share of Mining firms in terms of number of observations, the UK, with 13.8% of observations belonging to this sector, followed by the US (8.5%). This implies that Manufacturing is not the

predominant sector in Canada. In this country observations from Manufacturing firms are 23% of the total, a sizeable difference with the rest of the countries in the sample.

Table 11. Sectoral distribution of the observations (%).

Industry	US	UK	Germany	Italy	France	Japan	Canada	Total
Primary	0.4	1.1	0.8	0.6	1.0	0.2	0.4	0.5
Mining	8.5	13.8	1.7	2.6	3.0	0.4	61.9	13.6
Construction	1.9	5.4	3.1	3.0	2.8	8.8	1.0	4.0
Manufacturing	58.9	49.5	68.9	61.5	65.6	60.2	23.1	54.2
Utilities and transp.	15.4	10.7	13.5	24.8	11.6	7.1	8.3	11.9
Wholesale and retail t.	14.8	19.4	12.1	7.6	16.1	23.4	5.3	15.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on Worldscope data.

After presenting the evolution and distribution of the observations on corporate net lending in the dataset (as defined in Section 3.2.2.1), Figure 3 shows the quantitative evolution of the volume of total savings, capital expenditure and net lending in each country. The first aspect to highlight is that there is a generalised increase in the average values in corporate net lending during the period, which is in line with what reported by the literature on net lending (e.g. Cardarelli & Ueda, 2006; Brufman et al., 2013; Gruber & Kamin, 2015). This is particularly evident after the dotcom crisis when net lending increases considerably in all G7 countries (with the only exception of Canada). Following these considerations, it is possible to divide the 26 years that run from 1990 to 2015 into two sub-periods of similar length. The first one comprises the years that run from 1990 to 2001, while the second sub-period comprises the years 2002-2015.

With respect to the first sub-period, there are different features to remark. Although in most of G7 countries NFC listed companies were, on average, net lenders also during the 1990s, the level of net lending maintained relatively low compared to that recorded in the new century. During the first period, net borrowing positions were recorded in different years in all countries with the only exception of the US and the UK where, on average, firms were always net lenders. More importantly, during the first sub-period savings and capital expenditure tended to follow a similar path, which determined the relatively low levels of net borrowing and net lending. This similarity in the trends of savings and investment change during the second sub-period.

After the dot-com crisis, savings and fixed capital expenditure decouple, with the former rising much faster than the latter. As a result, there is a considerable increase in the level of

net lending in all countries with the only exception of Canada. During these years, corporate savings and capital expenditure increase at a very different pace among G7 members. Between 1990 and 2007, the average level of corporate savings doubled or tripled in most countries, while the increase in average investment lagged and, in some cases, remained stagnant (e.g. Italy).

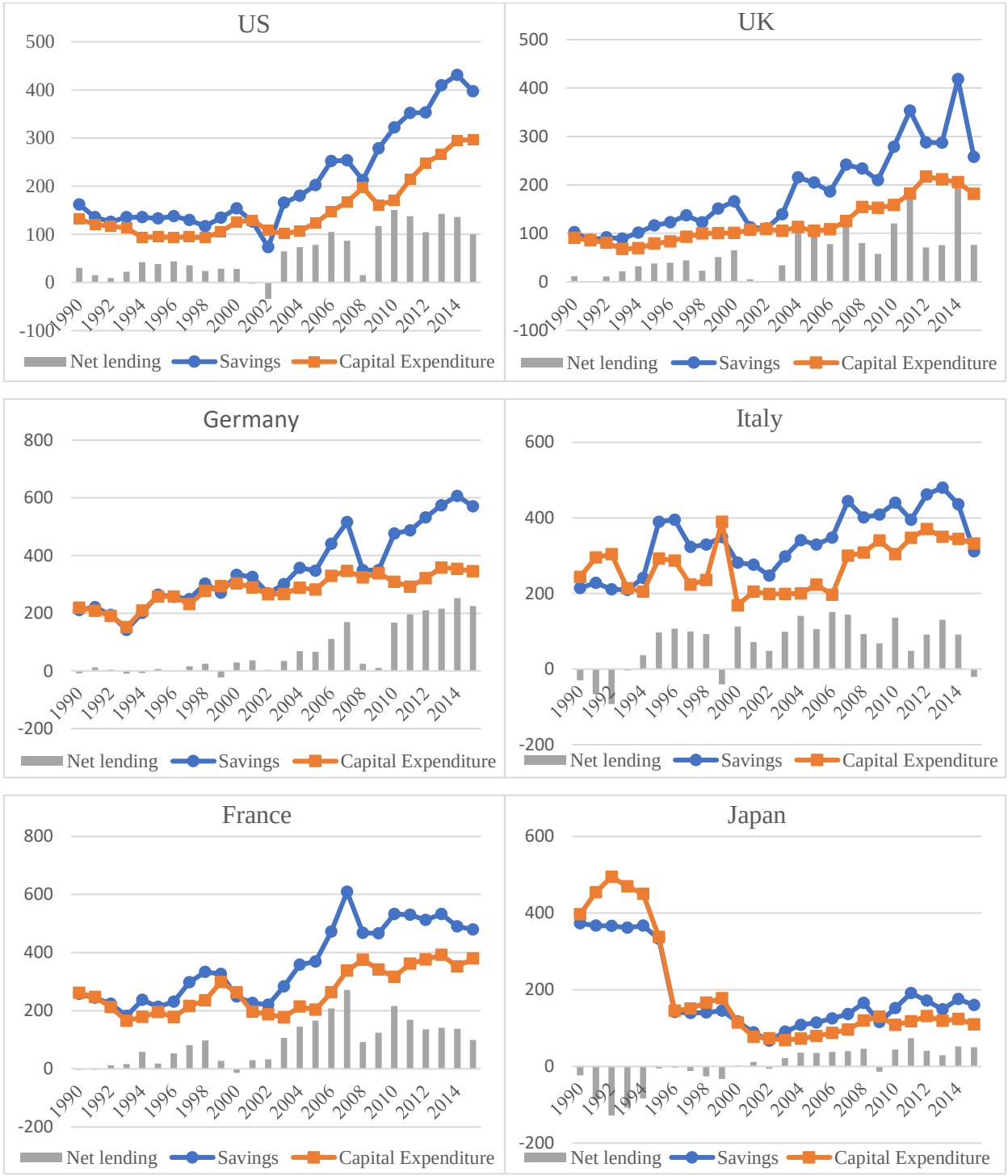
During the second period the most considerable drop in net lending is recorded during the Global Financial Crisis. This outcome was mainly due to the fact that during economic recessions corporate net income (and therefore savings) decreased more than capital expenditure. The after-crisis period shows a diversified picture among countries. In the US, Italy and France, savings and investment increased at a similar pace and net lending was fairly stable. In Germany and, to a lesser extent, Japan the recovery of savings was accompanied by a decline in average capital expenditure. After 2009 the level of corporate net lending stayed at a comparable level of the pre-crisis years, or even increased.

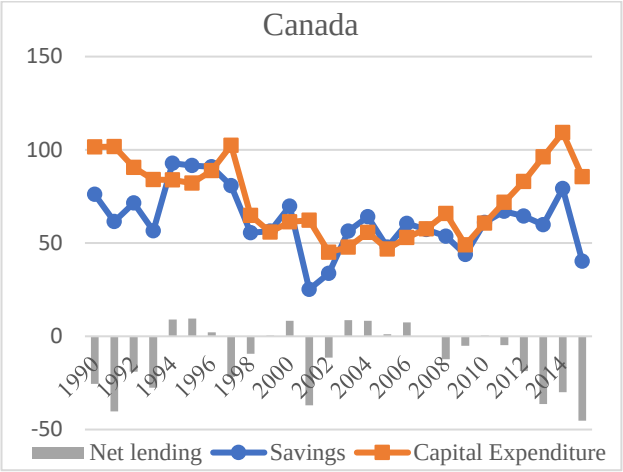
In this scenario, an exception is represented by Canada. In this country, savings and investment had similar magnitude until 2011, determining small net lending and, in some years, net borrowing positions. After this year average savings fell more than capital expenditure. As a result, Canadian non-financial listed firms are the only ones in sample that record a net borrowing position for most of the period. The peculiarity of the Canadian case will be further investigated in the Chapter 5 in light of the sectoral composition of Canadian firms. Here it is sufficient to mention that the Mining sector tends to have lower levels of net lending compared to the rest of the industries. Given the high share of Mining firms in Canada, the aggregate levels of net lending are lower than in the rest of the countries. Figure 17 in the Appendix shows that Canadian non-Mining companies tend to be net lenders, similarly to the aggregate figures of the rest of G7 countries. For the whole dataset, Mining companies have the lowest average ratio of net lending over total assets (Table 27 in the Appendix).

Another peculiar case is Japan. In contrast to other countries, both average savings and investment show a reduction, especially until 1996, which continues into the new century. This pattern is because data in Figure 3 reflects average values at the firm-level. As detailed in Table 10, there is a considerable change in the number of firms in the sample. The number of Japanese firms nearly tripled between 1995 and 1996. The new firms that entered in the sample in these years had lower volumes of savings and investment, which determined the reduction the downward peak of this year. Figure 16 in the Appendix depicts the *total* values of savings, investment and net lending by country and it can be appreciated that the peculiar

shape of Figure 3 disappears. This figure also shows that for the rest of G7 countries the trends in Figure 3 do not change considerably when total (not average) volumes are considered.

Figure 3. Average net lending y firm in each country (millions of US$).





Source: Author's calculations based on Worldscope data.

Despite the country specificities in the evolution of corporate net lending, it is possible to draw out a general picture from these data. With the only exception of Canada, between 1990 and 2015 net lending prevails over net borrowing in most countries. The difference between savings and capital expenditure is usually positive also during the 1990s. This aspect suggests that the listed NFC tend to be net lenders for most of the years, although there are significant differences between the first and second half of the period. Another key aspect that arises from this picture relates to the quantitative magnitude of net lending. The average level of net lending increases considerably during the period, especially after the dot-com crisis. This spectacular increase is resumed in Table 12. In most of the countries in the sample, the average levels of net lending multiplied by at least three times between the two periods.[25] In some countries the increase is even more remarkable. In Germany the level of average net lending was $7 million in the first sub-period and $125 million in the second sub-period, while in Japan these values went from $-41 to $35 million.

Table 12. Average values of corporate net lending by firm over the two sub-periods (millions of US$).

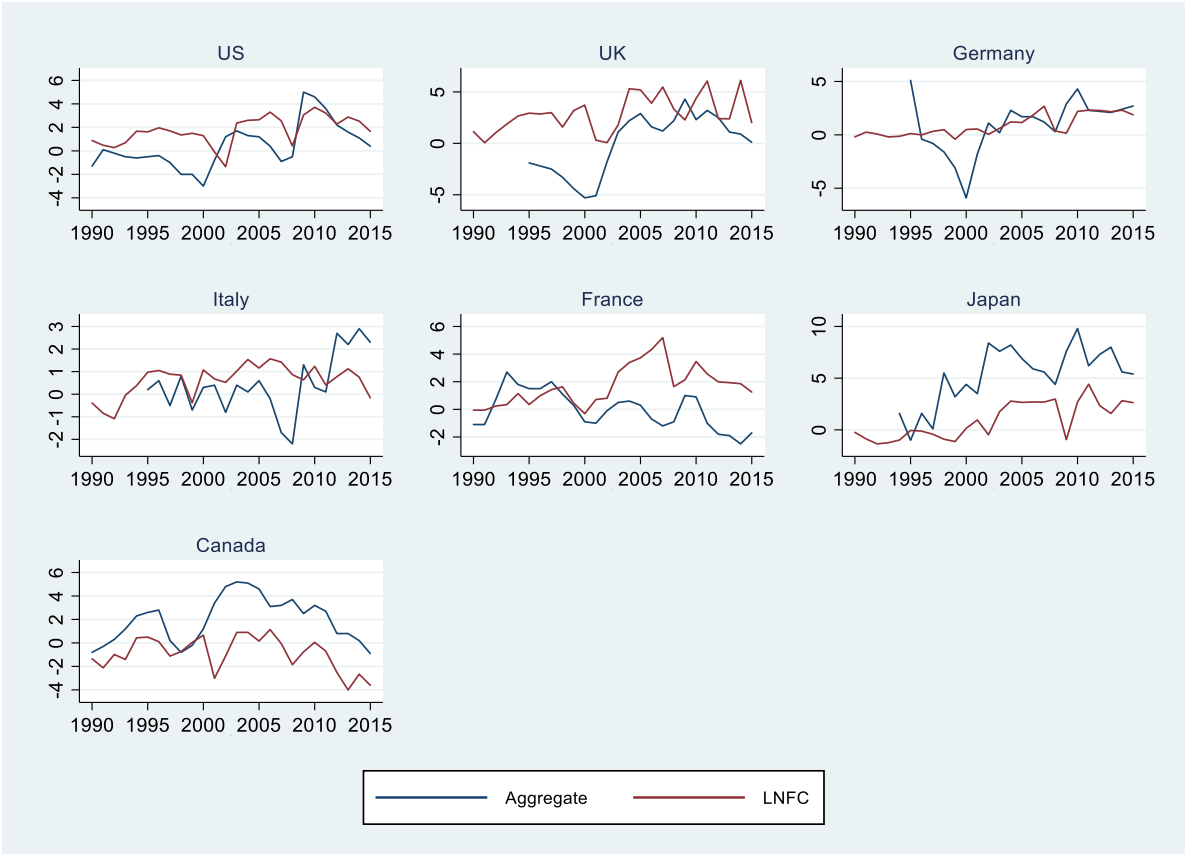
Period	US	UK	Germany	Italy	France	Japan	Canada
1990-2001	26	29	7	32	31	-41	-13
2002-2015	91	93	125	95	146	35	-10

Source: Author's calculations based on Worldscope data.

[25] Note that Table 12 does not exclude values for the global financial crisis, when net lending decreased in all countries of the sample.

To give a more detailed idea of the magnitude of these data, Figure 4 compares the evolution of corporate net lending (in terms of GDP) for the whole NFC sector with the dataset of listed NFC employed in this study. In several cases the two measures have a very similar magnitude in terms of GDP. This implies that, although the dataset employed is a sample of existing NFC, the volumes of net lending captured in this study are very significative. In most of the countries, the level corporate net lending of the listed NFC tends to be higher than net lending for all private corporations.

Figure 4. Aggregate corporate net lending vs. listed NFC (LNFC) corporate net lending (% of GDP).

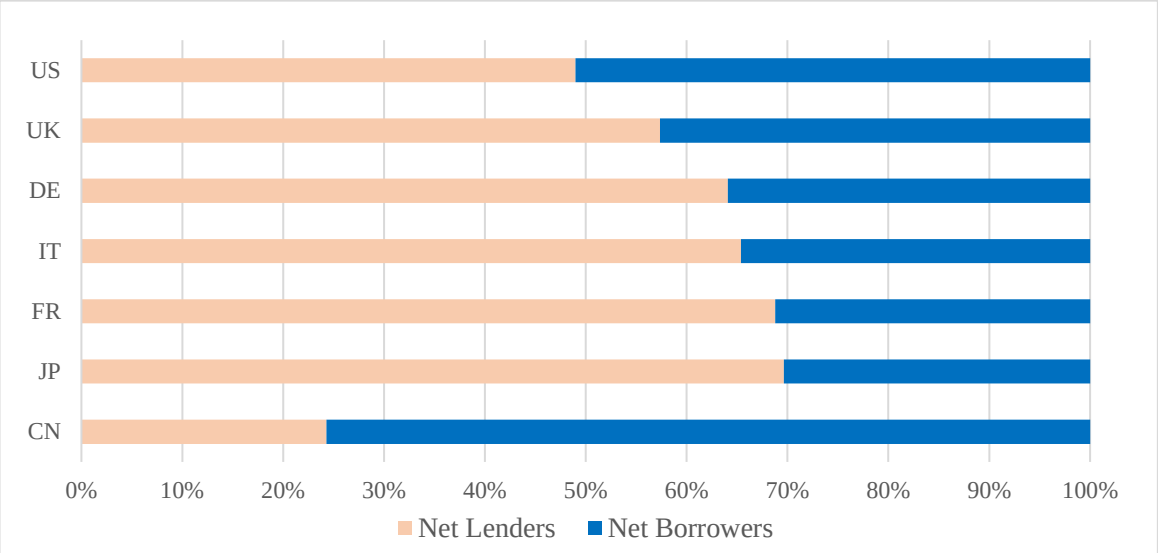


Source: Author's calculations based on OECD and Worldscope data.

The focus now moves on the frequency of net lending observations between countries. Over the whole period, European firms record the highest share of net lending observations in the total. Out of the total number of observations, net lending represents between 58% (in the UK) and 69% (in France) of total observations. Canada is the only country where the large majority of the observations records net borrowing status. This could be expected from the trend presented in Figure 3. On the contrary, Japan is the country that records the higher share of net lenders observations (nearly 70%). In the US the observations of net lending are

slightly less numerous than net borrowing ones (51% to 49%) even though the level of net lending constantly increases through time. This fact seems to suggest that in spite of a certain equality between the number of firms that are net lenders and those that are net borrowers, and that have more weight (i.e. are bigger) in the determination of the average trend.

Figure 5. Shares of Net Lenders/Net borrowers firms in each country (1990-2015).



Source: Author's calculation based on Worldscope data.

In light of these considerations, Table 13 explores the relation between firm size and net lending. In order to analyse this link, in each country the sample of firms was divided into quintiles according to their size. What emerges is that there is a positive relationship between firm size and net lending. Amongst smaller firms (quintiles 1 to 3) capital expenditure tends to exceed corporate savings, determining a net borrower status. Amongst top quintiles, firms are, on average, net lenders. This feature is shared by all countries. The table also shows that there is a considerable gap between the 4th and 5th quintile. In all countries the difference in the absolute values of net lending between these two groups is more than twenty times. Part of this huge difference in the absolute average values of net lending (from the 4th to the 5th quintile) may be explained by a right-skewed distribution of firms, where the distance from the top and 4th quintile is considerably bigger than the distance between other quintiles of firms. However, these trends are also valid when net lending is expressed as share of total assets. Although the difference between top quintiles is smaller than in absolute terms, the 5th quintile of firms tend to record the highest average ratio of net lending over total assets. This confirms that there is a clear divide between size and net lending status. While smaller firms are on average net borrowers, bigger firms tend to have growing levels of net lending.

Table 13. Average net lending by quintiles (Qt.) of sales. Millions of US$ and as ratio of total assets (%).

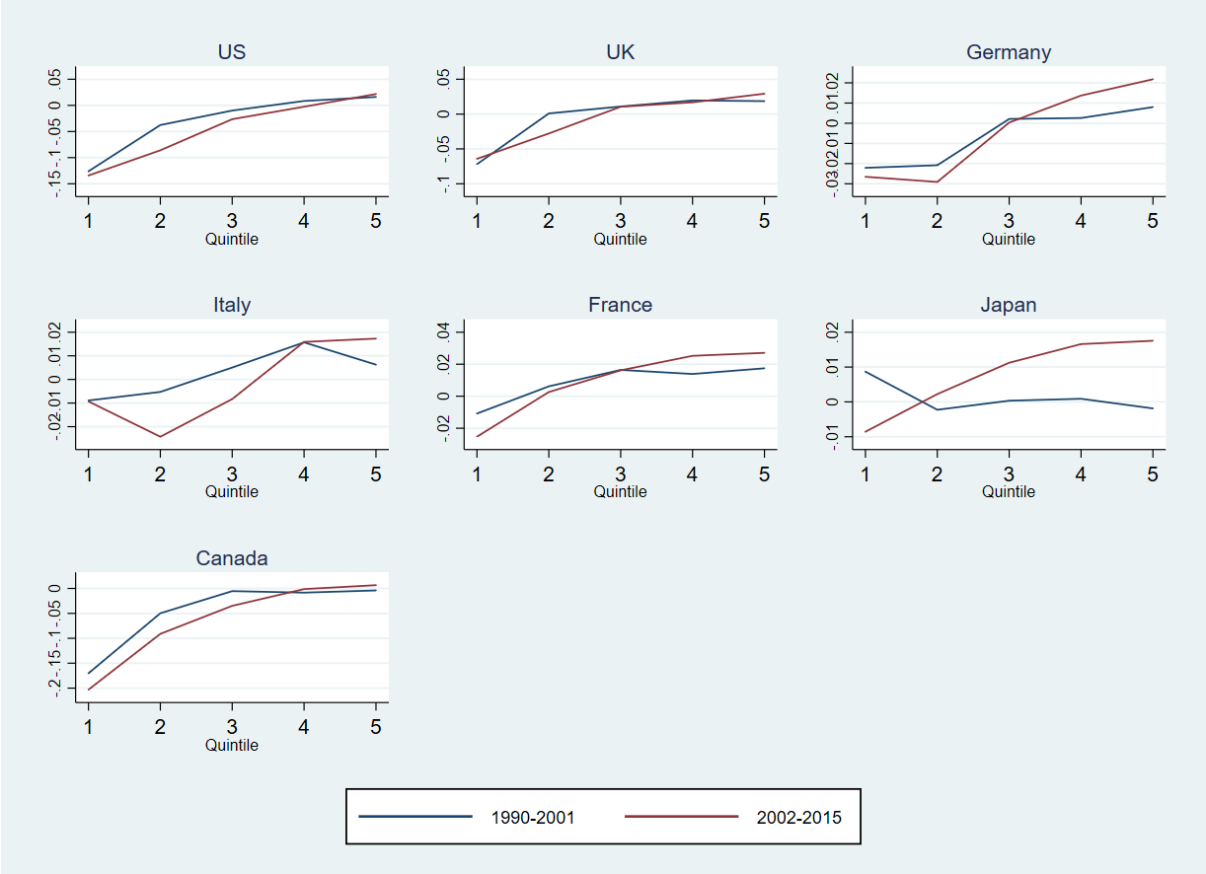
	Millions of US$					Net Lending over Total Assets				
	Qt. 1	Qt. 2	Qt. 3	Qt. 4	Qt. 5	Qt. 1	Qt. 2	Qt. 3	Qt. 4	Qt. 5
US	-8.2	-9.5	-11.8	-5.1	326.9	-30.6	-6.1	-1.7	0.2	1.9
UK	-4	-3	1.3	8.3	400.8	-16.3	-1.2	1.1	1.8	2.5
Germany	-1.5	-1.3	1.3	9.4	245.4	-10.8	-2.6	0.1	0.8	1.6
Italy	-7.3	-2.3	-2.4	11.2	276.9	-7.5	-1.6	-0.3	1.6	1.4
France	-2.7	1.6	4.1	13.3	396.9	-10.3	0.5	1.6	2.1	2.3
Japan	-2.5	0.1	2.1	7.9	86.2	-5.6	0.3	0.9	1.3	1.2
Canada	-7.8	-16.1	-21.7	-20.6	23.4	-28.7	-8.1	-2.3	-0.4	0.3

Source: Author's calculations based on Worldscope data.

Figure 6 explores in more detail the link between firms' size and corporate net lending. It illustrates the average level of the ratio of net lending over total assets by quintiles for the two sub-periods (1990-2001 and 2002-2015). In both sub-periods the tendency presented in Table 13 is confirmed, as there is a positive correlation between the levels of net lending and firm size.[26] This aspect suggests that the relationship between size and net lending holds irrespectively of the sub-period of analysis. More interestingly, Figure 6 shows that the polarisation in the level of net lending across quintiles increased between the first sub-period (1990-2001) and the second one (2002-2015). In the second sub-period, the ratio of net lending over total assets was lower among smaller firms than it was between 1990 and 2001. On the other hand, bigger firms belonging to the top quintiles recorded higher levels of net lending over total assets in the second subperiod than in the first one. This pattern is common to all G7 countries. Therefore, between 2002 and 2015 bigger firms increased the ratio of average net lending over total assets, while for smaller firms it decreased.

[26] The only exception is Japan. In the first sub-period the size of the firm seems not to be correlated with net lending.

Figure 6. Average ratio of net lending over total assets (%) by quintile of sales and sub-period.



Source: Author's calculations based on Worldscope data.

Overall, this section shows that the increase in corporate net lending was noticeable in all countries (with the exception of Canada) especially since the start of the new century. However, this increase was not uniform among firms. Bigger firms have higher levels of net lending, while smaller firms tend to be net borrowers. This polarisation increased between the first and the second sub-period of analysis.

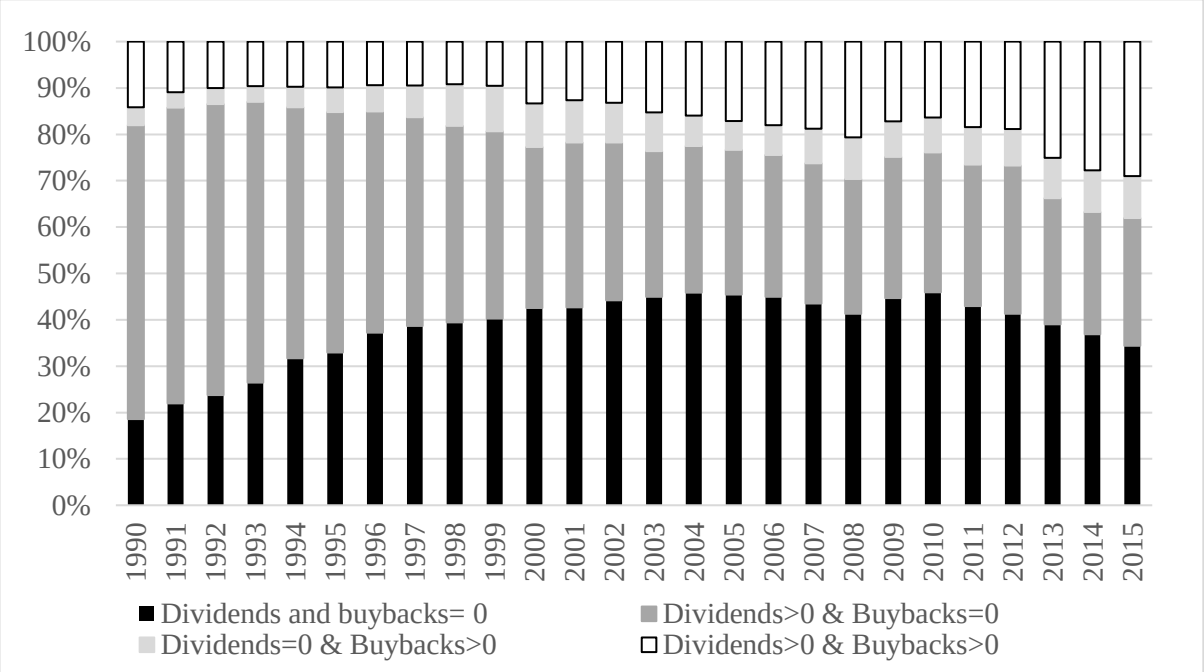
4.3. Financial payouts among listed NFC

After illustrating the rise of net lending, this section and the following describe the general trends of the variables connected to the variables of interest in the econometric specification detailed in Section 3.2.2. This task is necessary in order to link the theoretical discussion developed in Chapter 2 with the econometric results that will be presented in the next chapter.

This section starts by discussing the evolution of financial payouts and its relation to corporate net lending. As argued in the previous chapters, dividends and buybacks are the two main proxies employed to characterise the process of financialisation at the firm-level.

A first issue to consider is the frequency of financial payouts within the sample of firms in the dataset. The evolution of dividends and buybacks is crucial to characterise the process of financialisation that took place among G7 countries. Figure 7 depicts the change in the number of observations in these categories for the whole sample of listed NFC. Following the classification proposed by Grullon and Michaely (2002), in every year, companies are separated into four groups according to their payout policy: policy A, when both dividends and buybacks are equal to zero; policy B, when the firm pays dividends but buybacks are equal to zero; policy C, if the firm repurchases its shares but pays no dividends; policy D, when both dividends and buybacks are positive.

Figure 7. Share of firms by payouts status. Total sample.



Source: Author's calculations based on Worldscope data.

The figure displays that throughout the whole period, the majority of the firms in the dataset pay at least one type of payout. However, the share of firms that does not pay any form of payout is on the rise. At the beginning of the 1990s more than 80% of the firms paid dividends or repurchased their shares. At the end of the period, the proportion of firms with zero payouts (policy A) increases to approximately 40% of the total sample. At the same

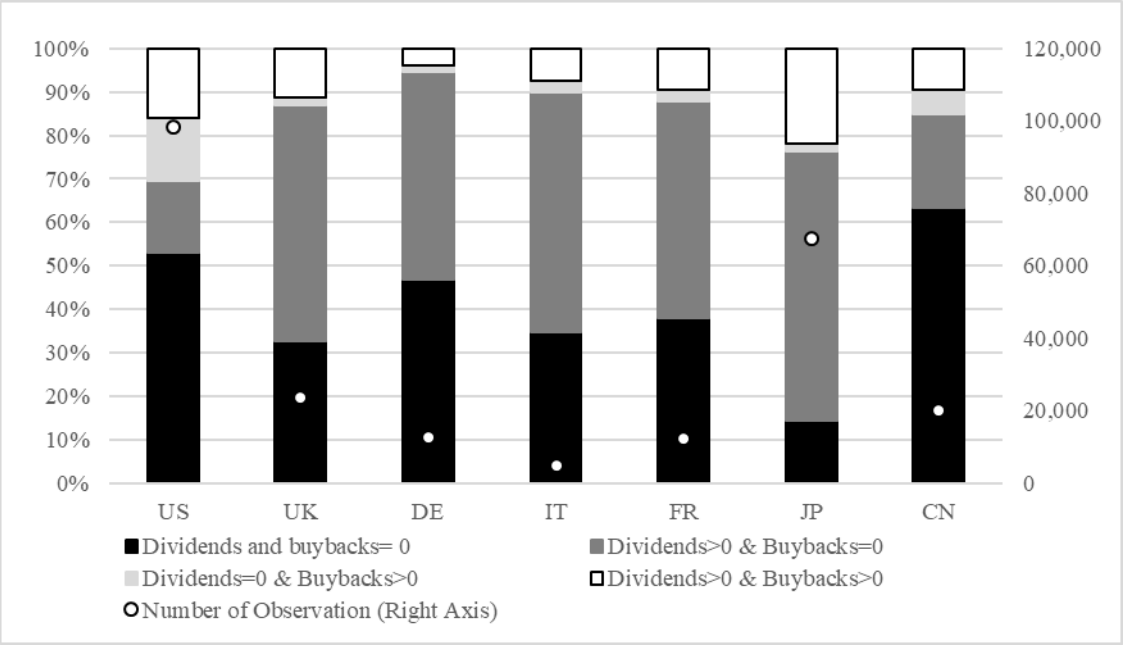
time, the share of firms that exclusively pay dividends reduces to approximately 25% of the total, while at the beginning of the period this category was more 60% of the total. These numbers reflect what is highlighted in the literature, in particular in relation to the decrease in the number of firms that pay dividends (see Von Eije & Megginson, 2008 on European countries; Floyd et al., 2015 on American firms).This reduction in the relative frequency of dividends payments is offset partially by the increase in share repurchases. At the end of the period, almost 40% of the firms in the sample repurchased their shares; in 1990 this proportion was below 20%.

Figure 8 describes how the four payout policies distribute across countries over the whole period. As was to expect in light of the distribution of data illustrated in Table 10, there is a marked heterogeneity in the number of observations between countries. The US accounts a total of approximately 100,000 observations. On the other hand, European firms record the lowest total number of observations, ranging between approximately 6,000 (Italy) and 30,000 (UK).

The US and Canada are the countries where the highest proportion of observations does not record any type of payout (more than 50% in both countries have payouts equal to zero). On the other extreme, around 85% of observations record at least one type of financial payout in Japan. European countries show an intermediate situation, where the share of observations with no payouts oscillates between 33% (UK) and 37% (Germany).

In terms of the type of financial payouts employed, the US, Japan and Canada are the countries with the highest share of firms that pay buybacks. On the contrary, European firms continue to prefer dividends rather than repurchasing of shares, which is in line with what is reported in the existing literature (ECB, 2007). This is partly due to the different legislation on buybacks across the world. It is only at the end of the 1990s that most European countries legally allowed companies to buy their shares (see Kim et al., 2005).

Figure 8. Share of firms by payout status by country (1990-2015).



Source: Author's calculations based on Worldscope data.

The growth in the number of listed firms that do not pay dividends, together with the decrease in the number of listed firms recorded since the mid-2000s, may suggest that G7 countries witnessed a decrease in the importance of stock market activity. However, the figures on the number of firms with payouts equal to zero contrasts with the boom in the volume of financial payouts during the period.

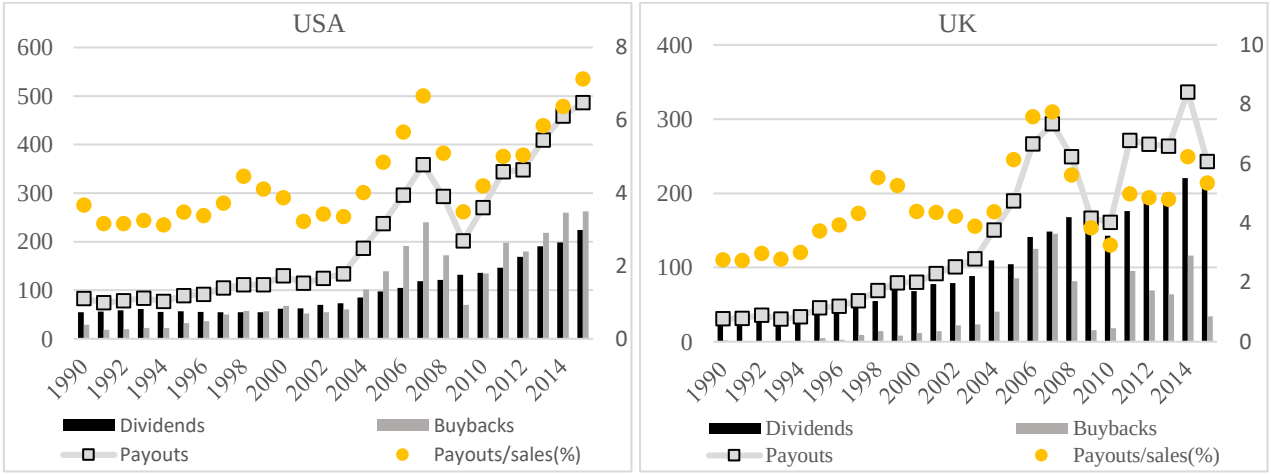
Figure 9 shows a remarkable increase in the volume of average payouts between 1990 and 2015. Average payouts more than double during this period in most of the countries. As in the case of net lending, there is a clear divide between the behaviour of payouts during the first sub-period (1990-2001) and the second one (2002-2015). During the first sub-period there is a general mild upward trend in the average payouts by firm. This generalised increase in the average volumes of payouts booms during the second sub-period, when total payouts surge, especially before the Global Financial Crisis. Between 2007 and 2010 payouts drop as a consequence of the global recession. This slowdown, however, was short-lived. After the Global Financial Crisis, payouts recovered in all countries except for Germany and Italy. In the case of the US, the UK and Canada, payouts even exceeded the peak of the pre-crisis years. Conversely, only in Germany and in Italy was there no recovery in the volume of average payouts by firm. In fact, the generalised growth in payouts is not the result of the size effect of the firms. The increase in payouts described so far does not change by scaling

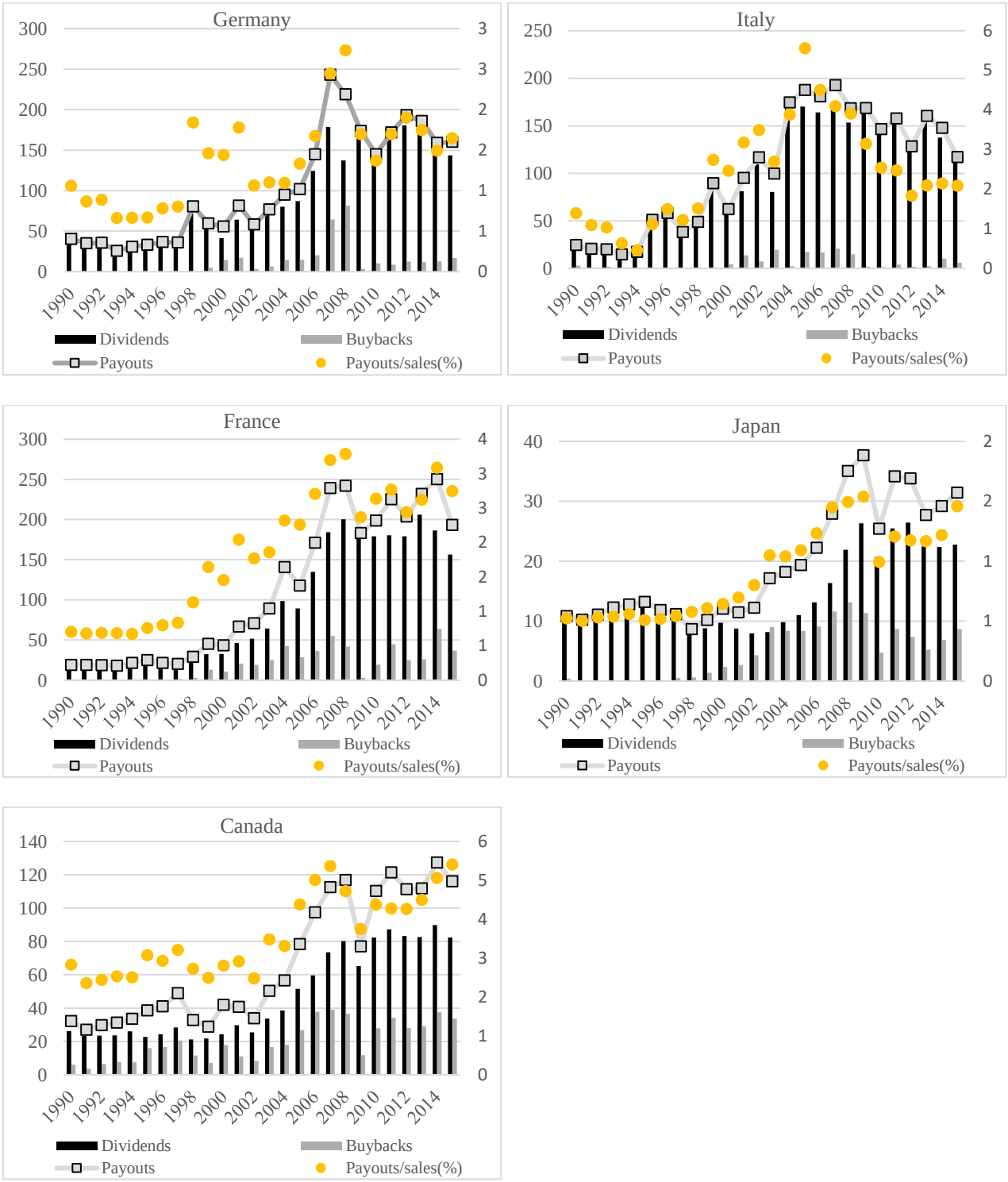
the volume of payouts to that of sales. In fact, the payouts over sales ratio follows closely the line of average payouts, which indicates that the average expansion in payouts was not the result of the swelling in "real" economic activity.

Despite the similarity in the shape of the average payouts curve across countries, the composition of payouts shows a high degree of heterogeneity between countries. The volume of share repurchases is usually low among continental European countries compared to that of dividends. This is partially due to the already mentioned limitations imposed on share repurchases in European countries until the end of the 1990s. Once these restrictions were removed, European corporations increased the volume of buybacks operations. Even though in European countries dividends payments always exceeded share repurchases, buybacks are not negligible in the period 2000-2007 when they record a rapid growth (particularly in France and, to a lesser extent, Germany). The picture is quite different for the rest of the countries, where share repurchases occupy a relevant proportion of total payouts, particularly after 2000. In the case of the US, the level of share buybacks is above that of dividends in different years, before and after the Global Financial Crisis, which is consistent with what reported by the literature on the increasing role of buybacks in the US (Lazonick, 2015).

In light of the evidence provided in Figure 7-Figure 9 it can be concluded that there is a certain polarisation among the firms in the sample. A consistent part of the firms does not record any sort of payouts. This group of firms has increased during the period, although it is not in the majority. This evidence contrasts with the quantitative evolution of financial payouts which has increased notably during the period. This trend is shared by all countries in the sample, irrespective of the composition (dividends or buybacks) of payouts.

Figure 9. Dividends, buybacks, payouts (dividends + buybacks) and payouts over sales ratio (% - right axes) by country. Average values (in millions of dollars) of firms with positive payouts.



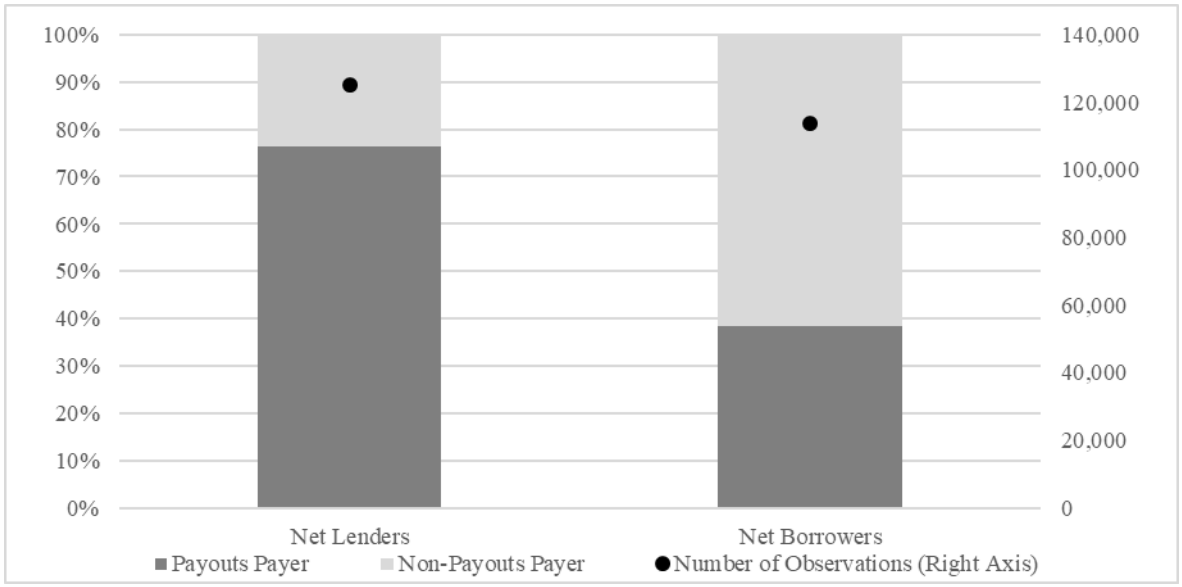


Source: Author's calculations based on Worldscope data.

After presenting the quantitative evolution of financial payouts, the analysis now focuses on the link between payouts status with the net lender/net borrower condition of the firm. To do so, total observations have been divided into four groups, depending on whether they recorded positive payouts (or not) and were net lenders (or not). The outcome of this classification is exhibited in Figure 10. Over the whole period, there are slightly more net

lender observations than net borrowers.[27] More importantly, there is a clear divide between the net lender/net borrower status and the payouts condition of the firms. In more than 70% of the cases, if a firm is net lender it also has positive payouts (left bar in the graph). This result reverts in the case of net borrowers' observations (right bar in the graph). In this case, only one third among net borrowers have positive payouts. This implies that there is a clear link between having positive payouts and being a net lender.

Figure 10. Share of firms with positive and zero payouts according to their net lending/net borrower status (Full sample: 1990-2015).



Source: Author's calculations based on Worldscope data.

Overall, financial payouts have increased their importance amongst all G7 countries. This trend is shared by all countries despite the composition of payouts seeming to be significantly different across countries and year. Moreover, Figure 10 offers preliminary evidence of the link between payouts and net lending status. The statistical significance of this link is one of the objectives of this dissertation and it will be addressed in more detail in the next chapter.

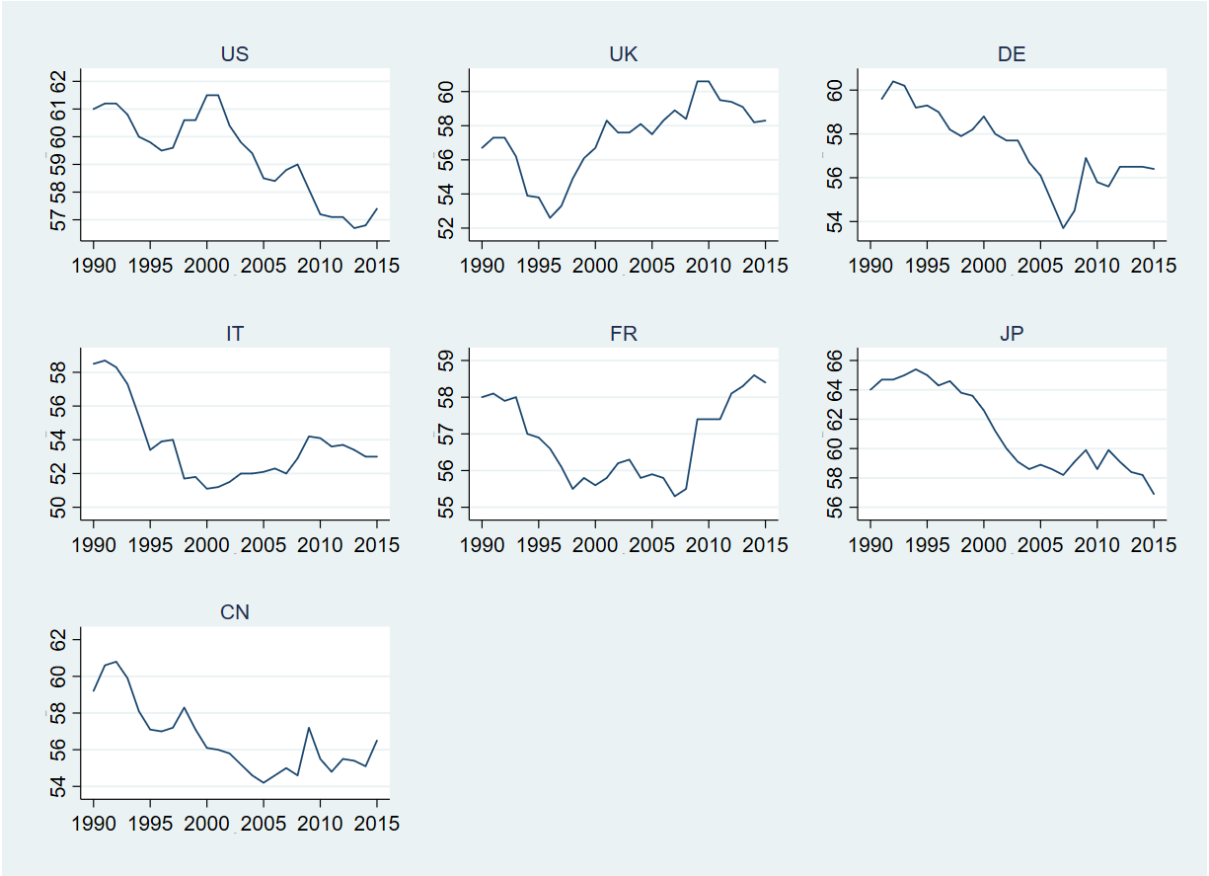
4.4. Functional income distribution among listed NFC

This section focuses on the second channel explored in this research, functional income distribution. The theoretical discussion presented in Section 2.4.2 stressed the renewed

[27] These numbers can be interpreted as the aggregate picture of Figure 5.

interest towards functional income distribution in economic analysis. Numerous studies (e.g. Luebker, 2003; Atkinson, 2009; ILO, 2012; Karabarbounis and Neiman, 2014) considered that, contrary to standard neoclassical economic models, functional income distribution is not constant, and it can change significantly in time. Figure 11 confirms that, for the whole corporate sector, there has been a consistent shift in the adjusted wage share among the majority of G7 countries. The wage share decreases in most countries until the Global Financial Crisis. The only exceptions are represented by the UK and France. In these countries the adjusted wage shares in 2015 was higher than it was in 1990. This, however, is not due to the absence in the historical decline of the wage share. This is because in all developed countries the most significant decrease of the wage share was recorded from the end of the 1970s and the first half of the 1990s (see OECD, 2015 Annex B), so that the period considered here does not grasp this decline in the wage share in some countries.

Figure 11. Adjusted wage share (% of GDP) at the aggregate country-level.

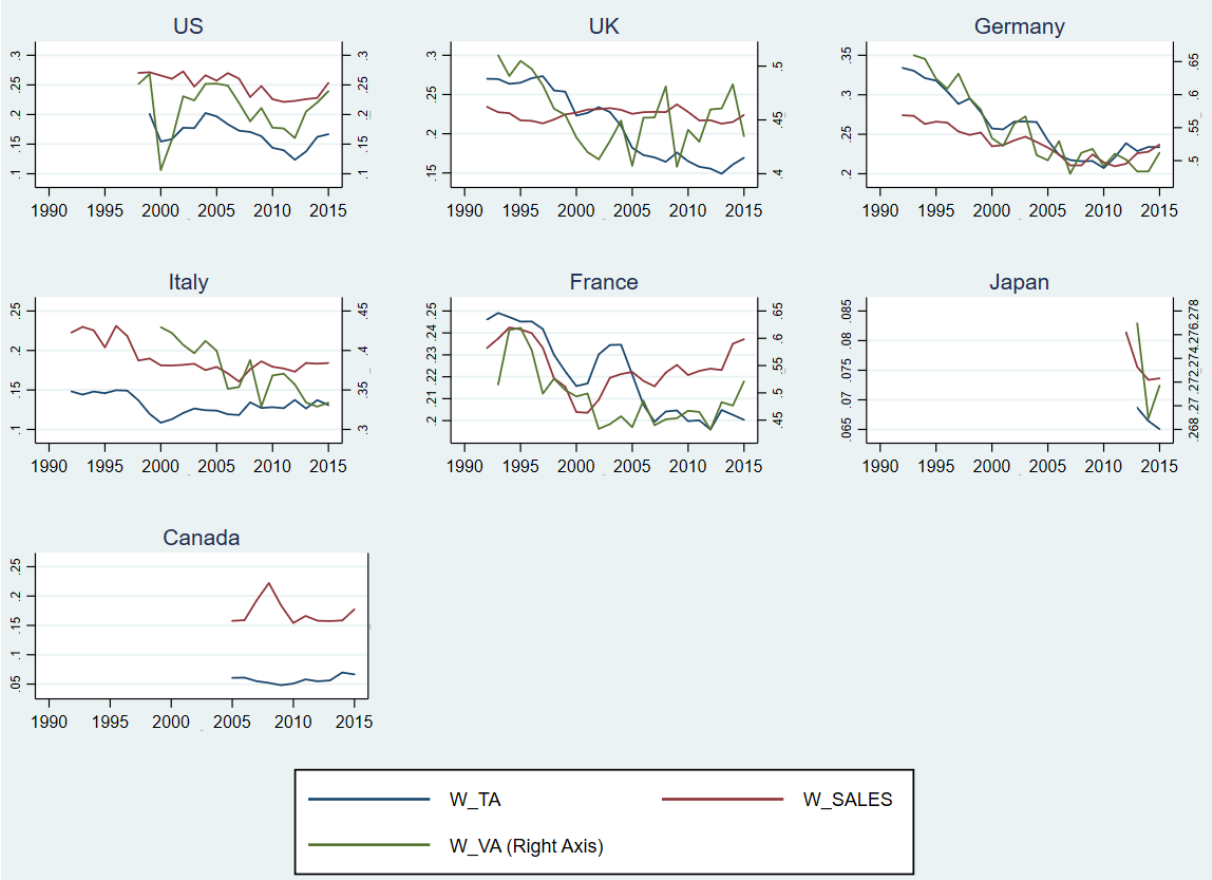


Source: AMECO.

Given the level of analysis of this research it is necessary to focus on the evolution of functional income distribution measures at the firm-level. Chapter 3 proposed three different

income distribution variables at the firm-level: (1) the ratio of wages over total assets (*W_TA*), (2) the ratio of wages over total sales (*W_SALES*) and (3) the ratio of wages over value added (*W_VA*). Figure 12 illustrates the change in the level of these three indicators of income distribution at the firm-level. In some cases, the series is not complete because of the unavailability on wage data for some years and countries. As discussed in the previous chapter, the availability of wage data is considerably lower compared to the rest of the variables. This is particularly the case of non-European countries (US, Japan and Canada), which show lower availability of wage data at the firm-level.

Figure 12. Wages over total assets (*W_TA)*, wages over sales (*W_SALES*) and wages of value added (*W_VA*). Median values by year and country (%).



Note: The graphs report the median values with at least 100 observations per year.
Source: Author's calculations based on Worldscope data

Despite this limitation, Figure 12 indicates a generalised reduction in the values of income distribution at the firm-level. The decline is common to all countries for all the three measures of labour share. This reduction applies also to the UK and France, the two countries that, at the aggregate level, did not record a generalised decline in the wage share during this

period.[28] This evidence suggests that in these countries listed NFC have recorded a more accentuated contraction in the wage share than the rest of the corporate sector.

Similar to aggregate data, in most of the countries the deterioration in the wage share is steady until the global financial crisis. Afterwards, there is a rebound in the level of wage share. The intensity of this recovery varies, being more accentuated in some countries (US) than others (Germany and Italy). Irrespective of this change in the trend after the global crisis, the average level of wage share at the end of the period was everywhere lower than at the beginning of the period.

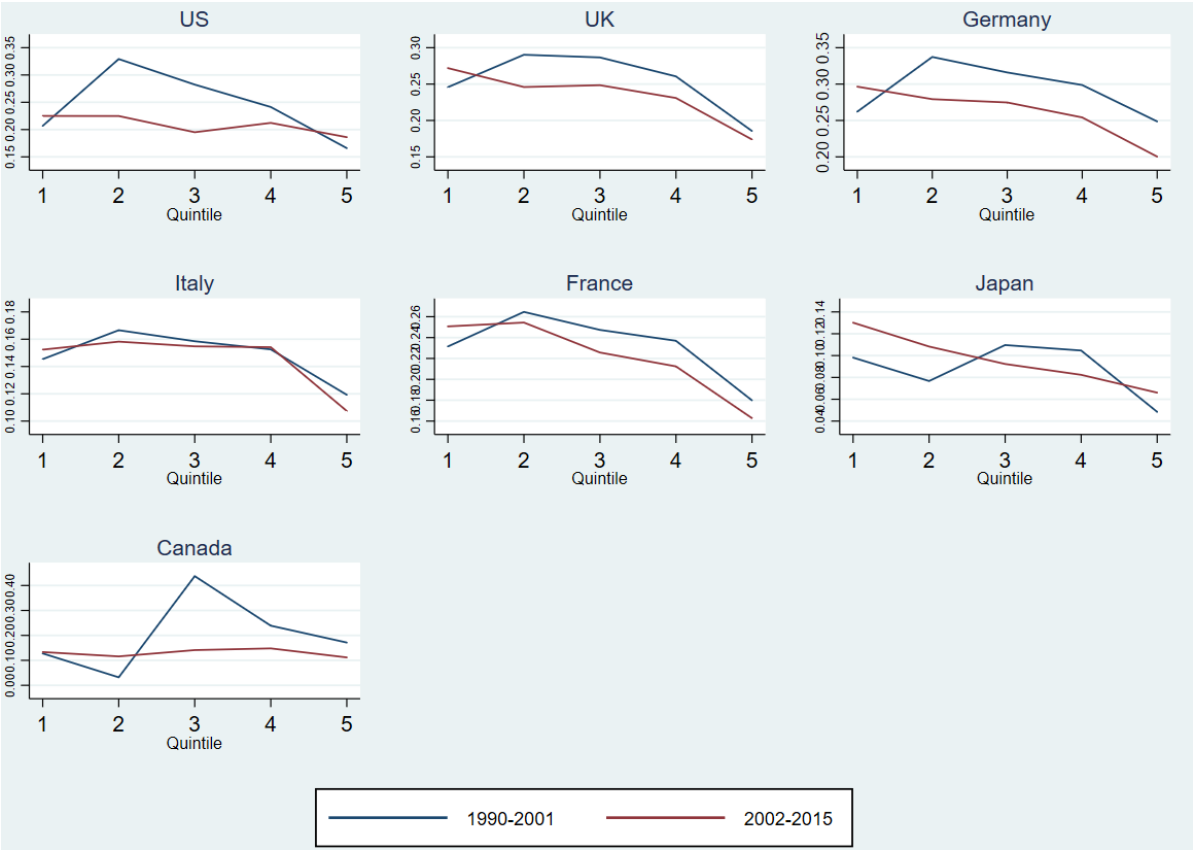
Furthermore, not only the labour share is lower in the second subperiod than it is in the first one, but the distance in terms of labour share between firms with higher and lower levels of net lending has increase from one sub-period to the other. Figure 13 divides, for each country, the sample of firms into quintiles of net lending/net borrowing (from the lowest to the highest level) and relates them with the ratio of wages over total assets by sub-periods of analysis (1990-2001 vs. 2002-2015). The general trend shows an inverse relationship between the wage share and quintiles of net lending. The higher the level of net lending, the lower the average wage share at the firm-level.[29] This feature is common to both sub-periods of analysis, but with some interesting differences.

Between 1990 and 2001, the curve of average wage share by quintile is, in most countries, inverse U-shaped. Firms with the highest level of net lending (5^{th} quintile) record the lowest wage to total assets ratio, but the first quintile (corresponding to net borrowing firms) has lower levels of *W_TA* compared to the second quintile. During the second sub-period this inverse U-shaped relationship disappears. Here, there is a generalised linear negative trend between net lending quintiles and income distribution. Moreover, the average values of wage share in the second sub-period tend to be lower compared to those in the first sub-period. This suggests that the wage share declined among most quintiles of firms in the dataset between 1990-2001 and 2002-2015. The only exception is represented by firms in the first quintile. Firms with the lowest level of net lending (higher level of net borrowing) are those that recorded a slight increase in the average level of wage share in the second sub-period. These figures imply that there is a polarisation between firms at the bottom and top quintiles

[28] In these countries the only measure that does not record a clear decline is the ratio of wages over sales.
[29] Also in this case the only difference is Canada, which records similar levels of income distribution across quintiles of firms, especially in the second sub-period.

in terms of income distribution.[30] Not only the labour share is lower in the second subperiod than it is in the first one, but the distance in terms of labour share between firms with higher and lower levels of net lending has increased from one sub-period to the other. The negative trend shown in Figure 13 may also be an indicator of the link between concentration, market power and their negative relationship with the wage share, in line with other studies that have pointed to the relationship between wage differentials and concentration of the firms (Dögüs, 2017, 2018).

Figure 13. Average wages over total assets ratio (%) by quintile of net lending/net borrowing and sub-period.



Source: Author's calculations based on Worldscope data

In light of the evidence introduced in this section, it can be concluded that there is a noticeable decline in the wage share among listed NFC. This reduction is common to all the three firm-level measures employed in this study. Considering the theoretical elaboration outlined in Section 2.4.2, it is to expect that a lower wage share contributes to the rise of

[30] Figure 18 in the appendix shows that by employing the ratio of wages over value added instead of the ratio of wages over total assets the results do not change.

corporate net lending. The preliminary evidence presented in this section also suggests that there is a negative relationship between the labour share and corporate net lending. Moreover, this relationship tends to become more accentuated during the second sub-period, which is when corporations dramatically increase the level of net lending. Although the evidence displayed so far is insufficient to provide statistically robust results, it offers useful insights into the link between the wage share and net lending.

4.5. Summary

This section has provided descriptive statistics on the evolution of corporate net lending, financial payouts and functional income distribution among listed NFC of G7 countries during the period 1990-2015, in order to address research *objective 1*. To the best of our knowledge, this is the first study that employs a dataset with a similar degree of detail in assessing the evolution of corporate net lending employing firm-level data. What emerges from the descriptive analysis is that there has been a sizeable increase in the level of corporate net lending among listed NFC. This increase is particularly evident from 2002. On the one hand, corporate savings flourished while, on the other hand, the average accumulation of physical assets raised at a slower pace or stagnated. This trend is common to all countries, with the only exception being Canada. The volume of corporate net lending of the sample is considerable and, when scaled to GDP, it is similar to or in excess to those recorded at the aggregate level.

The chapter also offered preliminary evidence of the link between net lender status and financial payouts (*objective 2*). Although more (both in absolute and relative terms) firms do not pay any payouts at the end of the period than at the beginning, during the same years the volume of payouts swelled considerably. The contrast between firms that pay payouts and firms that do not is also reflected by net lending status. Most net lender firms tend to have positive payouts while most net borrowing ones tend not to disburse payouts. This gives a hint on the relationship between financial payouts and net lending. As to the role of income distribution, the three firm-level variables indicate that there has been a significant reduction in the wage share. The decline in the labour share at the firm-level coincided with the rise in corporate net lending. This evidence is supported by the inverse relationship between the level of functional income distribution and the level of net lending.

Overall, these figures constitute preliminary evidence in favour of the theoretical mechanisms developed in Chapter 2, which postulated that there is a positive link between financial payouts and net lending and a negative relationship between income distribution

and net lending. The next chapter will explore in more detail the link between financialisation, the wage share and corporate net lending by employing the econometric model described in Chapter 3.

CHAPTER 5. The rise of net lending among NFC (1990-2015): econometric analysis

5.1. Introduction

This chapter provides the econometric evidence on the role of financial payouts and functional income distribution on the level of corporate net lending using the econometric model devised in Chapter 3. This analysis allows a detailed evaluation of the theoretical link between net lending and two possible factors: financialisation and income distribution. This analysis is required in order to address *objective 2* of the thesis (see Section 1.2).

Following this introduction, the chapter is divided into five main sections. First, Section 5.2 presents the results for the estimations for the full sample over the whole period of analysis. Second, Section 5.3 reports the estimates from the econometric model for sub-periods (1990-2001 and 2002-2015) in order to establish if the regressors change their explanatory power in time. Third, Section 5.4 discusses country-level regressions, to establish to what extent full-sample results can be generalised to every individual country. Fourth, 5.5 runs different robustness tests in order to provide further testing and evaluation of the empirical results. Finally, Section 5.6 resumes the main outcomes derived from the econometric tests and their relevance for economic analysis.

5.2. Regressions results. Full Sample

This section presents the econometric results of model (4) that was introduced in Section 3.2. Following the discussion of the nature of the model in Chapter 3, fixed-effects rather than random-effects estimation appeared to be the appropriate estimation strategy to follow. In addition to the theoretical analysis about what type of model to employ, the choice of fixed-effects model is confirmed statistically after performing the Hausman test. The outcome of the test shows that the null hypothesis of validity of the random-effect model is rejected, confirming to the fixed-effects strategy.[31]

It is worth recalling the baseline model (4), that is:

$$NL\_TA_{it} = \beta_1 F_{it} + \beta_2 ID_{it} + \gamma X_{it} + \alpha_i + \rho_t + \varepsilon_{it}$$

where NL_TA_{it} is the firm-level value of net lending while F_{it} and ID_{it} indicate, respectively, a vector variables of variables associated with the process of financialisation and functional

[31] Results for the Hausmann test are not reported.

income distribution. X_{it} is a vector of control variables which is necessary to capture factors that may impact the level of net lending and are mostly derived from the existing literature on net lending.[32] The terms α_i and ρ_t are the fixed-effect coefficients the year fixed-effect that account for the unobserved firm-specific characteristics and the business cycle effects which are common to all firms in the panel. Finally, ε_{it} is the error residual.

Summary statistics for the regressand and regressors of the econometric model are included in Table 14. From this table it can be seen that the ratio of net lending over total assets (*NL_TA*) has a left skewed distribution. Although the median is positive indicating that most of the observations correspond to a net lender status, the net borrowers are characterised by higher absolute values of the ratio of net lending over total assets which determine the left skewed distribution. Financial payouts (i.e. dividends + buybacks) show a low average because as stated in Section 4.3 there is a high proportion of firms that record zero payouts.

Table 14. Summary statistics.

Variables	Mean	Median	Std. Dev.	Min	Max
NL_TA	-0.078	0.006	0.233	-1.330	0.134
CURRLIAB	0.321	0.286	0.192	0.043	1.021
LEVERAGE	0.534	0.536	0.251	0.070	1.460
SALES	0.891	0.857	0.637	0	2.625
R&D	0.014	0	0.031	0	0.186
TOBIN_Q	1.747	1.264	1.527	0.007	14.99
LIQNEEDS	0.115	0.102	0.095	0	0.429
PAYOUTS	0.008	0.001	0.013	0	0.069
DIVIDENDS	0.005	0	0.009	0	0.040
BUYBACKS	0.001	0	0.004	0	0.028
W_TA	0.196	0.162	0.151	0.009	0.644
W_SALES	0.228	0.200	0.158	0.027	1.121
W_VA	0.346	0.320	0.197	0.011	0.837
LABSHARE	58.61	58.48	2.556	51.054	65.09

Note: The wage share at the country level (*LABSHARE*) is expressed in % of GDP.
Source: Author's calculations using Worldscope data.

Chapter 2 described the theoretical mechanisms that link the process of financialisation with the level of net lending. It was argued that the shareholder value orientation of the firms can contribute to the rise in corporate net lending, mainly through the negative effect that financialisation has on capital accumulation. In order to satisfy shareholders' interests, financial payouts tend to increase and under this regime of accumulation the expansion of production is considered subsidiary to shareholders satisfaction (e.g. Crotty, 2005; Onaran

[32] See section 3.2.23.2.2 for a more detailed discussion of each one of the variables.

et al., 2011). For this reason, dividends and buybacks are the two variables of interest employed in the econometric tests in order to identify the process of financialisation. It was also claimed that dividends represent the most common instrument to distribute wealth to shareholders, while share repurchases are a more recent instrument. As demonstrated by Almeida et al. (2016), companies use buybacks to manipulate share prices, not only in absence of profitable investment or as use of excess cash flow. As a counterpart, share repurchases have a negative impact on employment and investment, consistent with the shareholder value ideology (Lazonick and O'Sullivan, 2000; Lazonick, 2017).

With respect to the econometric evidence, Table 15 illustrates the results for the full sample of firms over the period 1990-2015, including the three variables of interests on financial payouts described in Section 3.2.2.2 (i.e. total payouts, dividends and share repurchases).[33] As can be seen from the table, all three variables of interest display as expected a positive and statistically significant effect on net lending, at the 1% confidence level. All standard errors in this and the following tables were corrected for possible heteroskedasticity and autocorrelation, following standard practice in the literature on panel-data (see Hoechle, 2007). Time effects were included to account for shocks that may affect all firms each year and the significance of these variables was tested performing a Wald test.[34]

A closer look at the estimated coefficients shows that, among our variables of interest, buybacks is the variable that has the highest coefficient in all specifications: an increase in one percent in share repurchasing increases net lending by a half percentage point. The coefficients for total payouts and dividends are similar, ranging between 0.3 and 0.4, meaning that an increase of one percent in payouts and dividends increases net lending by approximately one third of a percent. The different magnitudes in the coefficients, however, do not change considerably between variables of interest, which implies that, for the whole sample of firms there is not a radical difference in the influence that dividends and payouts have on net lending. Since, as observed, fixed-effects are included, we are able to conclude that there is a positive relationship between financial payouts and net lending across years.

[33] Given the number of regressions involved we first report and discuss regressions involving the financialisation variables of interest and, subsequently, results for the functional income distribution variables.
[34] Results for the Wald test are not reported as it is significant in all specifications.

Table 15. Regression results. Financialisation variables of interest. Dependent variable *NL_TA*. Estimation period 1990-2015.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CURRLIAB	-0.163***	-0.123***	-0.121***	-0.165***	-0.125***	-0.123***	-0.162***	-0.123***	-0.120***
	(0.00876)	(0.00824)	(0.00848)	(0.00885)	(0.00831)	(0.00856)	(0.00875)	(0.00822)	(0.00843)
LEVERAGE	-0.137***	-0.140***	-0.149***	-0.138***	-0.139***	-0.149***	-0.139***	-0.142***	-0.152***
	(0.00635)	(0.00610)	(0.00622)	(0.00638)	(0.00614)	(0.00627)	(0.00632)	(0.00606)	(0.00616)
SALES	0.0767***	0.0691***	0.0580***	0.0774***	0.0700***	0.0590***	0.0768***	0.0689***	0.0575***
	(0.00276)	(0.00251)	(0.00258)	(0.00279)	(0.00254)	(0.00261)	(0.00276)	(0.00250)	(0.00256)
TOBIN_Q	-0.00482***	-0.00354***	-0.000692	-0.00486***	-0.00365***	-0.000803	-0.00456***	-0.00326***	-0.000305
	(0.000720)	(0.000786)	(0.000734)	(0.000715)	(0.000785)	(0.000724)	(0.000708)	(0.000765)	(0.000719)
R&D		-0.688***	-0.620***		-0.679***	-0.616***		-0.692***	-0.619***
		(0.0532)	(0.0542)		(0.0536)	(0.0547)		(0.0539)	(0.0551)
LIQNEEDS			-0.0445***			-0.0448***			-0.0442***
			(0.0139)			(0.0139)			(0.0139)
PAYOUTS	0.349***	0.363***	0.329***						
	(0.0359)	(0.0339)	(0.0337)						
DIVIDENDS				0.372***	0.435***	0.377***			
				(0.0685)	(0.0656)	(0.0655)			
BUYBACKS							0.575***	0.531***	0.477***
							(0.0803)	(0.0753)	(0.0743)
Constant	-0.0259***	-0.00461	0.0263***	-0.0287***	-0.00808*	0.0229***	-0.0210***	0.00104	0.0319***
	(0.00452)	(0.00445)	(0.00533)	(0.00465)	(0.00460)	(0.00549)	(0.00446)	(0.00438)	(0.00524)
Observations	135,502	129,736	119,650	135,142	129,273	119,185	133,991	128,308	118,265
R-squared	0.069	0.071	0.078	0.069	0.071	0.078	0.068	0.070	0.077
Areg-R-sq.	0.678	0.653	0.607	0.678	0.653	0.608	0.677	0.652	0.607
N. Firms	15,817	15,428	13,918	15,694	15,303	13,793	15,865	15,471	13,960
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Fixed-effects estimation. Robust corrected standard errors in parentheses. Coefficients for the year dummies not reported. * significant at 10%; ** significant at 5%; *** significant at 1%

For each variable of interest, three different specifications were employed. Each specification differs in the number of control variables included in the regression. This diversification allows to increase the reliability of the results of the model. Notably, control variables have an important role in reducing omitted variables bias (Angrist and Pischke, 2009). The sequential addition of control variables is useful to evaluate the specific role of the new regressors and to establish if the different combination of regressors alter significantly the explanatory power of the variables of interest. As new control variables are added to the model, the coefficients of other variables could diminish. This is usually because the omission of relevant control variables may spuriously inflate the values of the coefficients of the variables comprised in the model, including the variables of interest. However, as it can be appreciated from Table 15, results are robust to the inclusion of different combinations of control variables. As the number of regressors increases the size of the coefficients of the variables of interest keep their sign and are not affected significantly in magnitude.

In addition to financialisation, Chapter 2 also maintained that it is possible to draw a negative relationship between the wage share and the level of net lending. A lower share of the product devoted to wage payments allows for the accumulation of higher profits, which are reflected in higher savings and therefore a higher level of net lending. This process becomes particularly relevant considering the decrease in the wage share recorded in most developed countries in the last decades, which is clearly reflected in the evolution of the firm-level functional income distribution variables in the sample.

Table 16 shows the results for the regressions regarding four functional income distribution variables. All four coefficients are statistically significant at 1% and have the expected negative sign, implying that an increase in the wage share has a negative impact on the level of corporate net lending. These results support the theoretical mechanism proposed in the previous chapters. A lower wage share facilitates the accumulation of corporate savings increasing net lending. Given this negative relationship, it is to be expected that the generalised decline in the wage share contributed to increasing the level of corporate net lending.

As described in Section 3.2.2, *LABSHARE* is the only variable that is expressed at the country level. One reason to include this measure among the variables of interest of income distribution is that the availability of wage data at the firm-level in extra-European countries

is low in certain years. In order to address this limitation, *LABSHARE* was added to complement of the firm-level variables. Given the different nature of this variable (i.e. country-level and not firm-level), the interpretation of this parameter implies that the labour share influences the level of corporate net lending of firms at the aggregate level. In this case, the distributive effects on net lending are not the result of dynamics internal to the firm, but the outcome of aggregate dynamics on firms' level of net lending. Moreover, as was shown in Figure 11 and Figure 12, the wage share at the country level presents a similar trend to firm-level variables so that it can be assumed that the labour share at the country level is positively related with the other variables of functional income distribution at the firm-level.

Also in this case, for each variable of interest three different versions of the model were estimated. The coefficients associated with the income distribution variables do not change significantly when the number of controls changes, which indicates that the effects of the variables of interest on net lending is not significantly affected by the different combination of dependent variables. Overall, this evidence reveals that the negative relationship between wage share and net lending for the whole sample of firms is valid for all the variables of interest employed.

After commenting on the effects of the variables of interest of the model, it is worth focusing on the effects of the control variables in capturing additional information to complement the analysis. Table 15 and Table 16 indicate that the level of debt (current liabilities and total liabilities) have a negative impact on the level of firms' net lending. This result can be associated with the lower capacity to accumulate savings of more indebted firms. This outcome is consistent with the findings of Brufman et al. (2013) , since debt repayments have a negative effect, reducing the level of corporate savings. Furthermore, as expected in light of the above discussion, *SALES* has a positive impact on the level of corporate net lending. This measure enables to capture for peaks in the business activity that may drive up the level of corporate savings. Firms with a higher ratio of revenues over total assets are expected to have more liquidity at their disposal that accrue the level of corporate savings.

Table 16. Regression results. Income distribution variables of interest. Dependent variable *NL_TA*. Estimation period 1990-2015.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CURRLIAB	-0.0900***	-0.0855***	-0.0915***	-0.0910***	-0.0853***	-0.0906***	-0.0912***	-0.0882***	-0.0859***	-0.164***	-0.125***	-0.123***
	(0.0132)	(0.0127)	(0.0126)	(0.0112)	(0.0111)	(0.0117)	(0.0224)	(0.0221)	(0.0230)	(0.00855)	(0.00803)	(0.00826)
LEVERAGE	-0.122***	-0.126***	-0.140***	-0.156***	-0.155***	-0.156***	-0.168***	-0.166***	-0.166***	-0.137***	-0.139***	-0.147***
	(0.0113)	(0.0112)	(0.0113)	(0.0105)	(0.0105)	(0.0109)	(0.0222)	(0.0217)	(0.0214)	(0.00609)	(0.00584)	(0.00594)
SALES	0.157***	0.145***	0.117***	0.0255***	0.0277***	0.0253***	0.0524***	0.0529***	0.0455***	0.0765***	0.0694***	0.0579***
	(0.00742)	(0.00717)	(0.00695)	(0.00426)	(0.00418)	(0.00461)	(0.00882)	(0.00847)	(0.00863)	(0.00267)	(0.00243)	(0.00249)
TOBIN_Q	-0.00691***	-0.00552***	-0.00136	-0.000324	0.00179	0.00200	0.000915	0.00176	0.00520**	-0.00448***	-0.00315***	-0.000271
	(0.00154)	(0.00162)	(0.00195)	(0.00160)	(0.00147)	(0.00156)	(0.00250)	(0.00216)	(0.00223)	(0.000678)	(0.000732)	(0.000699)
R&D		-0.370***	-0.285***		-0.386***	-0.321***		-0.486**	-0.369*		-0.667***	-0.606***
		(0.0747)	(0.0683)		(0.0720)	(0.0708)		(0.233)	(0.222)		(0.0526)	(0.0537)
LIQNEEDS			-0.0421*			-0.0381*			-0.0436			-0.0477***
			(0.0235)			(0.0226)			(0.0434)			(0.0136)
W_TA	-0.609***	-0.540***	-0.418***									
	(0.0298)	(0.0287)	(0.0266)									
W_SALES				-0.384***	-0.367***	-0.379***						
				(0.0196)	(0.0201)	(0.0217)						
W_VA							-0.0902***	-0.0898***	-0.0841***			
							(0.0153)	(0.0147)	(0.0159)			
LABSHARE										-0.00199***	-0.00240***	-0.00252***
										(0.000315)	(0.000281)	(0.000267)
Constant	-0.00139	0.00500	0.0299**	0.144***	0.137***	0.141***	0.129***	0.134***	0.140***	-0.0672***	-0.00839	0.0466**
	(0.0126)	(0.0126)	(0.0142)	(0.0138)	(0.0138)	(0.0152)	(0.0251)	(0.0251)	(0.0260)	(0.0243)	(0.0226)	(0.0212)
Observations	40,241	39,573	35,533	37,967	37,628	35,634	13,240	13,120	12,491	142,534	136,626	126,411
R-squared	0.124	0.116	0.112	0.131	0.129	0.128	0.089	0.095	0.099	0.068	0.069	0.076
Areg R-sq.	0.763	0.747	0.671	0.642	0.634	0.633	0.756	0.744	0.720	0.676	0.650	0.604
N. Firms	7,098	6,986	6,037	6,046	5,998	5,808	3,602	3,566	3,422	15,914	15,523	14,014
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Fixed-effects estimation. Robust corrected standard errors in parentheses. Coefficients for the year dummies not reported. ***** significant at 10%; ****** significant at 5%; ******* significant at 1%

TOBIN_Q occupies a secondary role compared to other variables, as coefficients tend to be small and become not statistically significant when the number of control variables increases. Therefore, it can be concluded that Tobin's Q does not play a primary role in the determination of net lending. *R&D* is strongly negatively associated with net lending. This suggests that the higher R&D has a negative effect on the amount of savings and therefore the level of net lending. It is important to stress that the specifications that include *R&D* do not significantly alter the coefficients of the variables of interest. Therefore, although R&D expenditure has a significant impact on net lending, it does not affect the validity of the two channels explored in this research.[35]

Finally, the proxy of liquidity needs (*LIQNEEDS*) has negative or no significant impact on the level of net lending. This evidence rules out the possibility that the rise in corporate net lending could be determined by a rise in the liquidity required by firms to perform their standard productive operations, since in this case we would expect to find a positive (not negative) relationship.

With respect to the overall fit of the model, an important aspect to consider refers to the R-squared values. Table 15 and Table 16 display two different R-squared values. These two sets of values vary considerably between them. The first measure represents the "within" R-squared. For the calculation of this value the effects of the groups (all of the dummy variables) are assumed to be fixed quantities. In this case, all of the effects for the groups (i.e. the firms' fixed-effect) are simply subtracted out of the model, and no attempt is made to quantify their overall effect on the fit of the model (Gould, n.a.). The values of the within R-squared range between 0.07 and 0.13 which, at first sight, may appear a poor fit for the regression. However, these values are common in firm-level studies with a large number of observations (e.g. Alexander and Eberly, 2018; Alves, 2018; Dittmar et al., 2003) and are in line with those obtained by other works on corporate net lending at the firm-level (e.g. Dao and Maggi, 2018).

The second R-Squared (labelled "Areg-R-Squared") represents the overall adjusted R-squared. Contrary to the within R-squared, this value includes the variations explained by the fixed-effect of the regressions. In this case, the level of the R-squared indicates a considerably better fit of the model, as it ranges between 0.61 and 0.77.

[35] The role played by R&D and its relationship with the literature on intangible capital are further explored in section 5.5.

The difference between the two values derives from the different modalities in which Stata estimates the R-squared for fixed-effects models.[36] In light of these considerations, the table report both R-squared values. This reflects standard practice in fixed-effects panel data regressions (von Eije and Megginson, 2008; Gormley n.a.; Greene n.a.).[37]

5.3. Sub-period analysis

Chapter 3 showed that the growth of net lending between 1990 and 2015 was not uniform over the whole period. It was argued that it is possible to distinguish between the first sub-period (1990-2001), characterised by prevailing small average net lending levels and the second sub-period (2002-2015) with a marked decoupling in the trends of corporate savings and investment which determined a fast increase in corporate net lending. In order to capture differences in the effects of the explanatory variables, Table 17 and Table 18 reports the econometric results for the two sub-periods.

The case for financial payouts analysis indicates that there are important differences between the two sub-periods. All the three financial payouts variables do not show any statistically significant relationship on the level of net lending between 1990 and 2001. These results change in the following period (2002-2015) when all the variables of interest are significantly correlated with the level of net lending, consistent with the evidence proposed for the whole period (Table 15). These findings indicate that although financial payouts have an important role to play in the rise of corporate net lending, their relevance applies only to the most recent period, corresponding to the strong increment in financial payouts from 2002 (Figure 9). Financialisation does not operate as a relevant factor in the determination of net lending in the first sub-period. The second sub-period, which records significant and positive payouts coefficients, corresponds to the intensification of financialisation process (for example, in terms of volume of payouts and households credit boom) which has been documented by different authors (Montgomerie, 2009; Stockhammer, 2013). This aspect can explain the differences recorded between the first and second sub-period. As showed in Figure 7 the first sub-period corresponds to a more diffused use of financial payouts (mostly

[36] In Stata language, the within R-squared is that obtained implementing the command **xtreg, fe** while the adjusted R-squared comes from the command **areg**. The two commands are equivalent in that they return the same coefficients and standard errors and only differ in the computation of the R-squared. This discussion on different values of R-squared arises from the use of Stata as software. Other statistical software only report the equivalent of the Areg-R-squared. For a comparison between R-Squared obtained in Stata's with those from other software, such as EViews and SAS, see Al-Gamrh (2015).

[37] Some authors go even further and maintain that the overall adjusted R-squared is the only relevant measure to consider for empirical analysis (Park, 2011, p. 32).

dividends). However, this widespread use corresponds to lower average levels of disbursements. With the intensification of the financialisation process during the second sub-period we witness a slight decrease in the frequency of the use of financial payouts (Figure 7), but with much higher volume of operations (Figure 9).

Table 17. Sub-periods analysis. Financialisation variables only. Dependent variable *NL_TA*.

	1990-2001			2002-2015		
	(1)	(2)	(3)	(4)	(5)	(6)
CURRLIAB	-0.141***	-0.147***	-0.153***	-0.0969***	-0.0971***	-0.117***
	(0.0120)	(0.0122)	(0.0133)	(0.0131)	(0.0132)	(0.0152)
LEVERAGE	-0.195***	-0.194***	-0.192***	-0.172***	-0.173***	-0.174***
	(0.00989)	(0.00982)	(0.0102)	(0.00981)	(0.00970)	(0.0106)
SALES	0.0544***	0.0560***	0.0551***	0.0604***	0.0610***	0.0635***
	(0.00396)	(0.00401)	(0.00422)	(0.00410)	(0.00411)	(0.00498)
R&D	-0.874***	-0.891***	-0.931***	-0.650***	-0.645***	-0.692***
	(0.0878)	(0.0853)	(0.0931)	(0.0767)	(0.0764)	(0.0876)
TOBIN_Q	0.00367***	0.00334**	0.00377***	-0.00265**	-0.00256**	-0.000833
	(0.00135)	(0.00131)	(0.00139)	(0.00128)	(0.00129)	(0.00127)
LIQNEEDS	0.00583	0.00941	0.00362	-0.0963***	-0.0965***	-0.147***
	(0.0213)	(0.0215)	(0.0235)	(0.0209)	(0.0210)	(0.0252)
PAYOUTS	0.0244			0.271***		
	(0.0559)			(0.0492)		
DIVIDENDS		-0.0288			0.211**	
		(0.115)			(0.0976)	
BUYBACKS			0.125			0.339***
			(0.0815)			(0.0727)
Constant	0.0656***	0.0632***	0.0654***	0.0302***	0.0307***	0.0378***
	(0.00826)	(0.00846)	(0.00845)	(0.00739)	(0.00739)	(0.00865)
Observations	46,564	45,758	40,425	62,410	62,310	48,025
R-squared	0.103	0.104	0.104	0.077	0.077	0.082
Areg R-sq.	0.655	0.658	0.654	0.683	0.687	0.698
N. of firms	9,121	9,007	7,596	10,863	10,734	9,794
Time effects	Yes	Yes	Yes	Yes	Yes	Yes

Fixed-effects estimation. Robust corrected standard errors in parentheses. Coefficients for the year dummies not reported. ***** significant at 10%; ****** significant at 5%; ******* significant at 1%

With respect to the analysis on income distribution, results observed in Table 16 over the full period are confirmed when the sample is divided into sub-periods. From Table 18 it can be observed that the functional income distribution variables maintain their significant negative relationship with firms' net lending. This implies that, different from the analysis on financialisation, the relevance of functional income distribution is valid throughout the whole period of analysis.

Table 18. Sub-periods analysis. Functional income distribution variables. Dependent variable *NL_TA*.

	1990-2001				2002-2015			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CURRLIAB	-0.0876***	-0.0938***	-0.0792**	-0.141***	-0.0885***	-0.0905***	-0.0720**	-0.102***
	(0.0226)	(0.0217)	(0.0391)	(0.0118)	(0.0185)	(0.0171)	(0.0306)	(0.0127)
LEVERAGE	-0.173***	-0.173***	-0.174***	-0.188***	-0.140***	-0.168***	-0.200***	-0.166***
	(0.0216)	(0.0205)	(0.0403)	(0.00939)	(0.0167)	(0.0168)	(0.0284)	(0.00918)
SALES	0.104***	0.0304***	0.0437***	0.0539***	0.129***	0.0151**	0.0505***	0.0603***
	(0.0107)	(0.00653)	(0.0132)	(0.00379)	(0.0102)	(0.00753)	(0.0123)	(0.00390)
TOBIN_Q	0.00116	0.00385	0.0121*	0.00376***	-0.00120	0.00242	0.00319	-0.00183
	(0.00553)	(0.00279)	(0.00673)	(0.00129)	(0.00249)	(0.00234)	(0.00346)	(0.00121)
R&D	-0.341**	-0.293**	-0.456	-0.864***	-0.310***	-0.394***	-0.560**	-0.639***
	(0.159)	(0.115)	(0.367)	(0.0893)	(0.0976)	(0.109)	(0.282)	(0.0738)
LIQNEEDS	0.0298	0.0349	0.0681	0.00303	-0.0995***	-0.111***	-0.0647	-0.0973***
	(0.0358)	(0.0357)	(0.0621)	(0.0210)	(0.0372)	(0.0355)	(0.0645)	(0.0203)
W_TA	-0.310***				-0.551***			
	(0.0391)				(0.0391)			
W_SALES		-0.430***				-0.367***		
		(0.0421)				(0.0322)		
W_VA			-0.0594***				-0.101***	
			(0.0226)				(0.0210)	
LABSHARE				-0.00199***				-0.00258***
				(0.000577)				(0.000538)
Constant	0.0552***	0.167***	0.117***	0.186***	0.0613***	0.170***	0.110***	0.0640
	(0.0180)	(0.0215)	(0.0360)	(0.0358)	(0.0146)	(0.0164)	(0.0220)	(0.0400)
Observations	11,760	12,059	2,702	48,814	20,775	20,566	8,935	66,294
R-squared	0.105	0.126	0.109	0.101	0.125	0.126	0.112	0.074
Areg R-sq.	0.603	0.570	0.767	0.653	0.746	0.709	0.772	0.681
N. of firms	2,347	2,333	918	9,201	5,012	4,814	2,841	10,995
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Fixed-effects estimation. Robust corrected standard errors in parentheses. Coefficients for the year dummies not reported. ***** significant at 10%; ****** significant at 5%; ******* significant at 1%

Given the solid evidence in favour of a negative relationship between the wage share and corporate net lending, it can be argued that changes in the distributive patterns (i.e. an increase in the wage share) would contribute to lower the level of net lending. On the contrary, the persistence of the decreasing trend in the labour share such as that experienced in the last four decades is likely to contribute further to the establishment of high levels of corporate net lending. Overall, these results indicate the importance of distributive aspects in the determination of the level of corporate net lending. From this perspective, the growth of net lending reflects changes in income distribution between wage and profit earners. These results bring to the fore the discussion around the factors that contributed to the evolution of the wage and profit share in the last decades. The discussion presented in Section 2.4.2 highlighted the criticisms deriving from a technical assessment of the issue

(for example, based on the elasticity of capital and labour) and stressed the importance of institutional factors (e.g. bargaining power of labour) in the determination of factors share. These results imply that one of the consequences of the shift in functional income distribution is reflected in the rise of corporate net lending.

5.4. Country analysis

As presented in Chapter 3, the availability of observations varies considerably in each country. Therefore, results illustrated in Table 15 and Table 16 could not be used to grasp country specificities for each G7 member. To deal with this aspect, Table 19 shows the values of the coefficients the variables of interest for each one of the seven countries in the sample.

To a great extent, results obtained in the full-sample estimation also apply to individual countries. *PAYOUTS* has a positive and significant impact among all countries, with the only exception of Japan. On close inspection, there are some interesting aspects that emerge once the analysis focuses on the two components of total payouts, i.e. dividends and buybacks. The US, UK and Italy are the three countries in which both dividends and buybacks are statistically significant. In Germany and France dividends are not significantly related to net lending while in Canada the situation is the opposite, as buybacks do not have a statistically significant impact on net lending while dividends do. Note that the positive effect of payouts on net lending holds also for Canada, that is the only country where firms in the sample did not record an increase in average net lending. Section 5.5 below discusses in more detail these results focusing on the role of Mining and non-Mining companies in this country.

It is interesting to note that the coefficient associated to share repurchases is significant among all European countries, despite of the lower diffusion of this type of instrument in Europe compared to the US. This outcome coincides with the growing importance of buybacks in Europe, consistently with the argument proposed by other authors (e.g. Kowerski, 2014; Sakinç, 2017) that stresses that also among European firms the growing role of this instrument can be associated with the maximisation of shareholders value ideology.

Despite these country specificities, however, the general picture shows that most of the countries record statistically significant results in at least two of the three financial payouts variables. Therefore, it can be concluded that financial payouts have an overall positive impact on the level of net lending in the individual countries, except for Japan. The fact that Japan is the only country where none of the financial payouts variables is significant could

be related to the characteristics of the process of financialisation that involved this country. On the one hand, Figure 10 in the Chapter 4 shows that Japan is the country with the lowest share of listed firms that recorded payouts equal to zero. This indicates that financial payouts are a very widespread instrument in Japan. On the other hand, the extensive use of these financial instruments is associated to relatively low levels of average payouts. Figure 9 indicates that the level of average payouts of Japanese firms is the lowest among G7 countries. These data are coherent with the argument, stressed by different authors, that Japanese NFC experienced a lower degree of financialisation compared to other developed countries. For example, Lapavitsas and Powell (2013) highlight the low level of financialisation (for example, proxied by the ratio of financial assets over fixed assets) that took place in Japan from the 1990s. While Japanese NFC experienced a high degree financialisation during the 1980s, this level decreases considerably in the following decades. Commenting the recent behaviour of Japanese firms, the authors maintain that "Japanese non-financial corporations have become reluctant, or are unable, to engage […] in financialising behaviour" (Lapavitsas and Powell, 2013, p. 367). This conclusion is also shared by Shabani and Toporowski (2015), who argue that, although there was an increase in the financialisation practices at the beginning of the 2000s, financialisation in Japan did not have the structural characteristics that it took in the rest of developed countries and variables. Despite the widespread use of financial payouts in Japan, the role played by financial payouts in this country is quantitatively (in terms of the average volume of payouts) lower compared with the rest of the countries in the sample. Therefore, the lack of statistical significance of the coefficients of financial payouts in Japan can be explained by the lower involvement in financialisation of Japanese NFC.

With respect to the effect of functional income distribution measures on the level of corporate net lending, the results are more uniform across countries. The coefficients reported in Table 19 are negative and significant for the great majority of countries. This evidence confirms the results provided in Table 16 for the whole dataset. Notably, this applies also to the case of Japan, where the coefficients of variations are usually higher than in other countries. As mentioned above, the analysis on income distribution may suffer from the fact that in non-European countries data on wages variables are available only for a minority of firms. Consequently, the analysis on income distribution in non-European countries is based on a lower number of firms than European ones, so that results may not be generalised to the full sample. This aspect should not be overlooked but, at the same time, there are at least three aspects to consider that reinforce the empirical analysis presented.

First, the absolute number of observations for firm-level income distribution variables in non-European countries are several hundred in most of the years, which provides the minimum requirements to reach statistical relevance.[38] Second, in non-European countries data on wages have a very polarised distribution over time. The availability of these variables is low in the first years of the sample but increases considerably in more recent years. This implies that the results for non-European countries are more relevant for the second sub-period (or some years in the second sub-period) than the first one. This applies especially to Japan, where firm-level data on functional income distribution are negligible until 2011 and approaching the total of observations in the last years of the period. Therefore, although it can be argued that the representativeness of firm-level variables on income distribution is not complete throughout the whole period, results are strongly significant for the last years of the analysis. Third, the analysis is complemented with the use of aggregate data on the wage share (*LABSHARE*), that is meant to provide an additional source of information regarding the role of income distribution on net lending.

Table 19. Country analysis (1990-2015). The table reports the coefficients for the variables of interest and robust standard errors only. Dependent variable *NL_TA*.

	USA	UK	Germany	Italy	France	Japan	Canada
PAYOUTS	0.281***	0.602***	0.327***	0.662***	0.269**	0.00724	0.562***
	(-0.045)	(-0.108)	(-0.104)	(-0.144)	(-0.112)	(-0.0897)	(-0.126)
DIVIDENDS	0.282**	1.007***	0.208	0.815***	0.271	-0.298	0.583*
	(0.109)	(0.152)	(0.170)	(0.201)	(0.183)	(0.164)	(0.287)
BUYBACKS	0.485***	0.862***	0.709**	0.719*	0.704***	0.0964	0.343
	(0.0968)	(0.271)	(0.342)	(0.427)	(0.215)	(0.145)	(0.271)
W_TA	-0.510***	-0.523***	-0.215***	-0.112**	-0.279***	-0.520***	-0.985***
	(0.102)	(0.0456)	(0.0424)	(0.0453)	(0.0499)	(0.130)	(0.145)
W_SALES	-0.486***	-0.428***	-0.348***	-0.147***	-0.315***	-0.763***	-0.341***
	(0.0928)	(0.0324)	(0.0419)	(0.0457)	(0.0488)	(0.130)	(0.0748)
W_VA	-0.422***	-0.0830***	-0.0237	-0.0872***	-0.0382**	-0.155***	n.a.
	(0.0999)	(0.0304)	(0.0569)	(0.0207)	(0.0154)	(0.0361)	n.a.
LABSHARE	-0.00596***	-0.000622	-0.00493***	0.000769	0.000682	-0.00117***	-0.00229*
	(0.000577)	(0.000713)	(0.00105)	(0.00102)	(0.00129)	(0.000318)	(0.00126)

Note: The table shows the results of the coefficients of the variable of interest only. In every regression we included one variable of interest at the time. Fixed-effects estimation. Control variables employed in each regression are: *CURRLIAB*, *LEVERAGE*, *SALES*, *R&D*, *TOBINQ*, *LIQNEEDS*. Robust corrected standard errors in parentheses. Coefficients for the year dummies are not reported. ***** significant at 10%; ****** significant at 5%; ******* significant at 1%

[38] In this sense, the only exception is the case of Canada for the variable *W_VA*, where there are not sufficient observations.

With respect to this last variable of interest reported in Table 19, country-level results broadly confirm the negative relation between the labour share and corporate net lending. In this case, three out of seven countries do not report statistically significant coefficients. This outcome may be due to the fact that firm-level variables in the sample may be more indicated to capture firm-specific dynamics, while the strength of the link between the wage share at the country-level could be mediated by other factors, such as different institutional setting operating on the labour market or the structure of listed NFC in relation to other non-listed companies.

Overall, this section broadly confirms the aggregate results presented in the previous sections for the aggregate sample. The most relevant differences concern the role played by financial payouts. Although in most countries the positive relationship with net ending is statistically significant, some variables are not significant in all G7 countries. Lastly, it can be concluded that the country-level evidence strongly supports the negative link between the wage share and net lending provided for the aggregate dataset.

5.5. Robustness tests

In order to test the validity of the results presented in the previous subsections, different robustness tests were performed. As discussed in Section 3.2.2, the definition of net lending employed in the literature differs from that employed in most of firm-level studies. While the standard definition subtracts dividends payments from net income in order to obtain corporate savings, the definition of savings employed in this work does not discount dividends from net income. This decision rests on the conceptualisations of dividends followed in this research, and on the fact that we are interested in obtaining the level of savings before financial payouts (dividends and buybacks) are realised. In order to provide results that are more readily comparable with the rest of the studies on corporate net lending at the firm-level, the main econometric model was estimated employed the following definition of corporate net lending which is equal to the standard definition of net lending at the firm-level employed by other authors (e.g. Brufman, Martinez and Pérez Artica, 2013; Saibene, 2018):

$$NL\_TA\_2 = Net\ Income + D\&A - Dividends - Capital\ Expenditure \quad (8)$$

where NL_2 indicates the alternative definition of net lending. Outcomes for these estimations are showed in Table 28 in the Appendix. Notwithstanding the different definition

of net lending, results are in line with those presented in Table 15 and Table 16 of this chapter. No appreciable differences can be found between the results achieved employing the two measures of net lending. Hence, it can be concluded that the results presented above are not determined by the specific definition of net lending employed in this research.

An additional round of regressions involves the addition of R&D expenditure to physical investment. Part of the literature on intangible capital (Haskel and Stian, 2017; Orhangazi, 2018) argues that the fall in investment in fixed assets can be partially explained by the rise of intangible investment. As part of this story, the lower level of physical investment is just the result of changes in the composition of investment, from physical to intangible. Therefore, the standard measurement of investment would be misleading, as it does not consider the growing amount of intangible investment. With respect to the analysis of corporate net lending, this would imply that the rising level of net lending is also the consequence of the fact that standard measurements do not include intangible capital together with fixed investment, resulting in an inflated measurement of net lending. In order to deal with this perspective, Table 29 in the Appendix displays the results for the regressions employing the following definition of net lending:

$$NL\_TA\_3 = Net\ Income + D\&A - (Capital\ Expenditure + R\&D) \qquad (9)$$

where NL_TA_3 indicates the alternative definition of net lending accounting for the rise of intangible capital. Different from the main definition employed in this research, in this case corporate investment is equal to the sum of tangible and intangible capital. The results for these estimations show that there is no relevant difference with the outcomes provided in Table 15 and Table 16. All the coefficients associated to the variables of interest have the expected sign and their size do not differ significantly from the main results, implying that the estimations are robust to the inclusion of intangible capital to physical investment. These results reinforce those of authors such as Philippon (2018) who argue that the rise in intangible capital is not enough to explain the slowdown in capital accumulation.

Finally, a further test enquires more closely on the Canadian case. As illustrated in Section 4.2, Canada is the only country that did not experience a significant increase in corporate net lending during the period. At the same time, this country recorded a high participation of Mining companies in the sample (nearly 62% of total observations). Although country results are in line with those obtained for the rest of G7 countries, it can be posited to what extent Mining companies determined the results displayed in Table 19 for Canada. To disentangle this aspect, Table 30 in the Appendix includes a new round of regressions for

Canada only. The outcomes of these regressions are different in that they include an interaction dummy variable for mining companies and the variable of interest so that the model is:

$$NL\_TA_{it} = \beta_1 F_{it} + \beta_2 F_{it} * Min\_Dum_i + \beta_3 ID_{it} + \beta_4 ID_{it} * Min\_Dum_i + \gamma X_{it} + \alpha_i + \rho_t + \varepsilon_{it} \quad (10)$$

where Min_Dum_i is a dummy variable that takes the value 1 in case the industry belongs to the Mining sector and 0 otherwise. It can be appreciated (Table 30 in the Appendix) that the main results concerning the effect of financial payouts and income distributions variables do not change radically. In three out of six regressions, the interaction with the industry dummy variable is not statistically significant. However, there are some aspect that is worth highlighting. The effect of *PAYOUTS* on net lending is higher among Mining companies than in the rest of the firms. In the case of *W_SALES* and *LABSHARE* results indicate that within Mining companies the effects of these two variables on corporate net lending is reduced, as the interacted dummy variable has a positive and significant coefficient. Although this nuancing effect, the overall effect of the wage share on net lending of Mining companies is still negative also for these two variables. Hence, it can be concluded that although there are some differences between Mining and non-Mining companies, these differences are restricted to few variables and do not alter radically the effect of the variables of interest on net lending. In other words, the results of the model are not altered sensibly from Mining and non-Mining companies.

5.6. Summary

This chapter presented the results for the econometric tests on the link between financialisation and functional income distribution on corporate net lending for a panel of listed NFC belonging to G7 countries. The different tests performed support the theoretical mechanisms described in Section 2.4 and the stylised evidence pictured in Chapter 4. First, the level of financial payouts have a positive impact on corporate net lending. These outcomes are valid for all the three variables employed to capture financialisation. The values of the coefficients associated to each one of the variables is not very different, although payouts have a slightly bigger impact on the dependent variable. Overall, these results contribute to the financialisation literature that stresses the negative link between financialisation and investment (e.g. Davis, 2018; Tori and Onaran, 2018) and expands it to the analysis of net lending. As highlighted the literature (Orhangazi, 2008b), financialisation represents an ideal condition to satisfy shareholders' interests at the expenses of the

expansion of production. One of the consequences is the rise in corporate net lending, via the incentive to hold liquidity to be channelled to financial payouts and the negative impact on investment.

Within this general trend, however, there are relevant distinctions to make. During the first sub-period (1990-2001), the relationship between financial payouts and net lending is statistically not relevant, indicating that the link between financial payouts and net lending consolidated only during the new century. Considering these findings, it can be concluded that only the more recent and acute phase of financialisation had a direct impact on corporate net lending. This is a crucial aspect, as it shows that although the rise of shareholders orientation is well rooted in contemporary capitalism, financialisation does not have a uniform impact in time and space on net lending. This is further testified by the heterogenous impact that financial payouts have in different countries, particularly Japan where, despite the increase in net lending, financial payouts does not play a relevant role in the rise in corporate net lending.

Functional income distribution is also confirmed to be an important channel in the determination of net lending. According to the mechanisms discussed in Chapter 2, the reduction in the wage share at the firm-level allows the accumulation of higher profits which are reflected in higher savings that impact positively on net lending. This aspect relates to different motives that may have contributed to the decrease in the wage share.

The econometric analysis found a statistically significant relationship between the different variables of functional income distribution implemented in the analysis and corporate net lending. These results hold for both sub-periods indicating that distributive aspects (and the causes that contribute to income distribution) should be considered to explain the increase in net lending.

In line with the literature presented in Section 2.4.2 (Burke and Epstein, 2001; OECD, 2015; Guschanski and Onaran, 2017), it was argued that the diminution of the wage share should not be viewed as the outcome of technical factors[39], but the product of different and interrelated institutional and political factors (such as capital movements liberalisation, decreased bargaining power, globalisation etc.) that contributed to the decrease in the wage share in developed countries. Corporate net lending is the result of the reduction in the wage

[39] Such as the decline of the price of capital goods (Karabarbounis and Neiman, 2014). It was argued in section 2.4.2 that this position lies on the assumption that the substitution between labour and capital is higher than one. However, it was showed that the evidence in favour of this position is limited, and to a great extent does not support this assumption.

share that fuelled corporate profits and allowed for the accumulation of savings. These findings build on the literature of corporate net lending, especially those studies performed at the firm-level. As evidenced in the literature review (Chapter 2), despite the growing interest around this topic the hypothesis explored so far by this group of literature only finds partial empirical support. The results presented in this chapter offer new evidence regarding the factors that contributed to the level of corporate net lending. The methodology employed shows various similarities with the literature on net lending at the firm-level (e.g. Brufman, Martinez and Pérez Artica, 2013; Dao and Maggi, 2018; Saibene, 2018). A more detailed discussion involving the existing literature will be developed in Section 7.2 in the concluding Chapter 7. Here it is sufficient to mention that, from the methodological perspective, one peculiarity of this study compares the rest of the literature resides in the definition of corporate net lending at the firm-level. This difference may suggest that the findings of this chapter are not strictly comparable with the existing literature on net lending. In order to deal with this possible criticism, the robustness tests section performed the econometric models employing the definition of net lending at the firm-level usually employed in the literature. This allows to conclude that the main results were not determined by the different construction of the dependent variable. In addition, the idea that intangible capital may alter the general results has been discarded, since the inclusion of R&D expenditure to fixed capital expenditure does not alter the results.

These conclusions hold for most of the countries with very little exceptions. In most of G7 countries at least two variables on financial payouts are positively and statistically linked to net lending (the only exception being Japan). With respect to the functional income distribution channel, the uniformity of results across countries is even higher than in the case of the financialisation channel. As to other country specificities, the high participation of the Mining industry in Canada does not alter significantly the results obtained for the full sample. Hence, it is possible to conclude that the evidence provided in this chapter supports the idea that financial payouts and functional income distribution play a significant role across the whole sample. Additional elements for discussion will be considered in the concluding chapter of this thesis.

CHAPTER 6. From net lending to financial dependency: a critical appraisal of the external financial dependency index

6.1. Introduction

After analysing the impact of financialisation and functional income distribution on net lending, this chapter critically appraises the External Financial Dependency (EFD) index originally developed by Rajan and Zingales (1998) in light of the previous analysis about the rise of corporate net lending. Chapter 2 introduced and discussed the EFD index and stated that, according to the original formulation, the EFD index is meant to be a measure that captures the need for each industry to rely on external sources of finance to cover their expenditure in fixed capital. The formula of the index relates a flow of liquidity of the firm (cash flow) with capital expenditure (Section 2.5.1).

The elaboration of the concept of EFD is based on two fundamental assumptions, namely that the level of industry EFD is steady (or at least that it does not change significantly) across time and between countries. Essentially, this stability is meant to reflect the structural and invariable technological characteristics of each industry. Some industries are considered to be structurally more reliant on external sources of finance than others. From this perspective, it is possible to rank industries according to their EFD, from the least to the most dependent on external finance. The assumptions of stability in time and space are crucial for the literature that employs the EFD index. In fact, numerous studies use the values of the EFD index calculated by Rajan and Zingales for American firms in the 1980s as a universal proxy of the industry EFD (see Section 2.5.2 for more details). Despite the wide use of the EFD and the increasing availability of firm-level data, there have been only limited attempts (Raddatz, 2006; Kroszner, Laeven and Klingebiel, 2007; Hsu, Tian and Xu, 2014) to recalculate the index and there is little discussion aimed at evaluating to what extent these two assumptions find empirical validity (see Section 2.5.2 for details). This chapter fills this gap by extending the calculation of the EFD index to the G7 countries and embracing a period that runs from 1980 to 2015.

There are different reasons to believe that the two assumptions need to be reconsidered. In Section 2.5.3 it has been argued that it is reasonable to maintain that the technological features that are meant to determine the level of the index are not constant, as technical change may alter the level of the index. For example, the differences in the processes of mechanisation and automation among different industries may lead to an alteration in the ratio of cash flow over capital expenditure, and the degree of concentration of the industry

may have significant impact on the EFD level. Moreover, some industries in the original Rajan and Zingales (1998) estimation record EFD values that are higher than one. Given the formula of the EFD index (equation (1) in Section 2.5.1), these outcomes are obtained only if industries record negative cash flows. While negative cash flow is possible for some period of time, it is hardly believable that these conditions represent a structural technological and invariable feature of the industry.

Furthermore, Section 2.5.3.1 claimed that the definition of the EFD index has important analogies to that of corporate net lending. In fact, corporate net lending also relates a measure of internal funds of the firm (savings) to physical investment. Despite this similarity, the scopes of the two indicators (net lending and EFD index) and the related literature departs from radically different perspectives. As discussed thoroughly above, the level of net lending is not constant over time and it is widely accepted that it can change between countries. Notably, the causes that contributed to the recent rise in net lending have motivated a range of studies, including this one. Conversely, the assumptions behind the construction of the EFD index imply that industry EFD values are fundamentally stable in time and across countries. It is therefore necessary to investigate in more detail, from the theoretical and empirical perspective, the relationship between the measure of net lending and the EFD index. This analysis is key in order to establish to what extent the EFD index can be considered a proxy of corporate net lending. A close degree of homogeneity between the EFD index and corporate savings and a high degree of variation of the EFD index in time indicates that the EFD index is a proxy for corporate net lending, and not an invariable measure of the technological needs of external finance of NFC. On the other hand, it can be established that the two indicators effectively grasp different phenomena only to the extent that they are different, both on definitional and empirical grounds.

All these reasons lead to the argument that it is possible to believe that the definition of EFD needs to be assessed in light of the rise of net lending and that the assumption of stability of the index needs to be revised. This necessity has been formulated explicitly in two research objectives that established the necessity of analysing the similarities and differences between measures of corporate net lending and EFD normally employed in the literature (*objective 3*), and testing the assumptions of stability in time and across countries of the EFD index (*objective 4*). The analysis that follows addresses in more detail these objectives, establishing to what extent the two measures are theoretically and empirically different and testing if the hypotheses of stability in time and space hold for G7 countries between 1980 and 2015.

To address these aspects, the chapter compares the definitions of EFD and net lending to highlight the elements of similarity and differences between the two indicators (Section 6.2.1). It will be maintained that the accounting differences between the two indicators are minimal, as the variable of liquidity employed in the EFD index is very close to the definition of savings employed in the calculation of net lending. Then, Section 6.2.2 reproduces the EFD index expanding the original calculations. After calculating the industry values for G7 countries for four different periods, the hypotheses of stability in space and time of the original index are tested. The results indicate that these assumptions find limited or no support in empirical estimations. Furthermore, the resemblance between the EFD index and net lending is tested empirically in Section 6.2.3, by reproducing a new version of the EFD index that employs savings instead of cash flow. The firm-level values of this new EFD index are compared with those obtained employing the same variables as in Rajan and Zingales (1998). This comparison allows a conclusion that the two measures reach analogous values, implying that the EFD index can be interpreted as a proxy of corporate net lending. These findings have important consequences for economic analysis and for the literature that employs the EFD index. These implications are discussed in Section 6.3 which summarises the main findings of the chapter.

6.2. External Financial Dependency index: what does it really measure?

6.2.1. EFD index and corporate net lending: theoretical comparison of the concepts

In order to disentangle the relation between EFD index and corporate net lending, this subsection explores the theoretical definitions behind the variables that constitute the two measures. As discussed in Section 3.2.2 corporate net lending for each firm *i* is equal to:

$$NL_i = Savings_i - KE_i \tag{11}$$

While the EFD index is defined as:

$$EFD_i = \frac{(KE_i - CF_i)}{KE_i} = 1 - \frac{CF_i}{KE_i} \tag{12}$$

where *CF* stands for cash flow and *KE* for fixed capital expenditure. It can be immediately appreciated that the only relevant difference between these equations is represented by the measure of liquidity employed, savings in the case of corporate net lending and cash flow in the case of the EFD index.

As discussed above, corporate savings are equal to firms' net income plus depreciation and amortisation, that is:

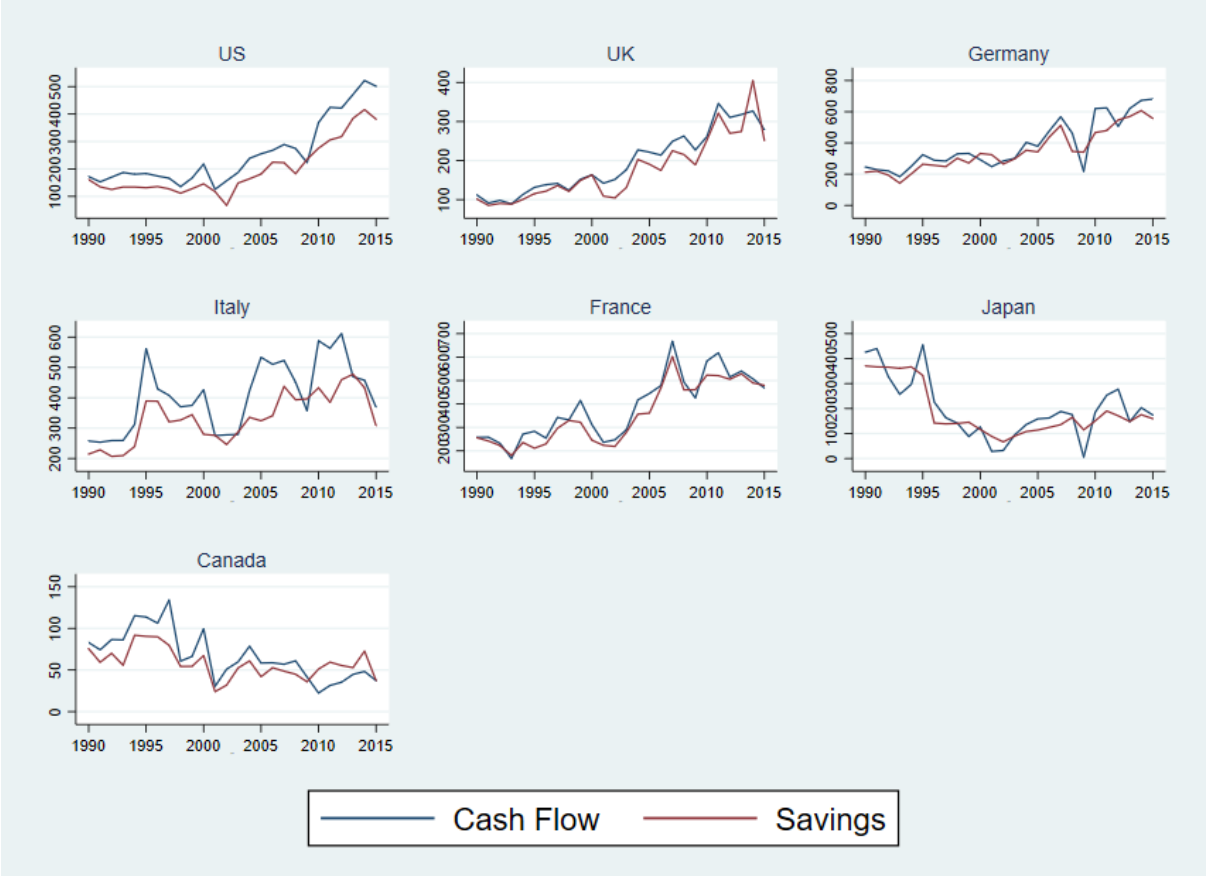
$$Savings = Net\ Income + D\&A \quad (13)$$

Net income is defined in the Worldscope manual as "the income after all operating and non-operating income and expense, reserves, income taxes, minority interest and extraordinary items" (Worsldscope, 2013, p. 556). The definition of cash flow employed in the original formulation of the EFD index is equal to "cash flow from operations […] plus decreases in inventories, decreases in receivables, and increases in payables" (Rajan and Zingales, 1998, p. 564). Cash flow from operations is defined by the Worldscope manual as "the sum of net income and all non-cash charges or credits" (Worsldscope, 2013, p. 485). By reviewing these definitions, it can be immediately acknowledged that the definitions of net income and that of cash flow from operations are very similar. Cash flow from operations is largely constituted by net income, and it only differs from net income as it also includes non-cash charges or credits. A further difference between savings and cash flow is that the former adds depreciation and amortisation to net income, while the latter adds changes in inventories, receivables and payables to the definition. Despite these differences, savings and cash flow are largely constituted by net income. This represents a first element that suggests that saving and cash flow (and therefore net lending and the EFD index) might be analogous measures. In order to explore more in detail this link, Figure 14 illustrates the evolution of these variables in each G7 country. The figure clearly shows that these two variables are highly correlated with each other. Both the general trend and the absolute values of cash flow and savings are akin in all countries, implying that the two variables are very similar.

Once established that corporate savings and cash flow are practically substitute measures, it is straightforward to conclude that net lending and the EFD index fundamentally capture the same phenomenon.[40] If this is the case, given equations (11) and (12) it is to be expected that there is an inverse relationship between net lending and the EFD. Negative (positive) values of *NL* would indicate that the firm is net borrower (net lender), i.e. that corporate savings are insufficient (sufficient) to cover their capital expenditure. On the contrary, if cash flow is insufficient (sufficient) to cover physical investment, the EFD index will be positive (negative).

[40] Further evidence of this assertion will be provided in Section 6.2.3 below.

Figure 14. Cash Flow and Savings by country. Average values by firm (millions of US$).



Source: Author's elaboration using Worlsdscope data.

Before addressing in detail the relationship between EFD index and corporate net lending, the chapter replicates the EFD index, extending the original results to the rest of G7 countries and to more recent years, and to the test of the assumptions of constancy of the index across countries and in time. Section 2.5.3 critically discussed these assumptions, proposing different mechanisms that may alter the values of the index, undermining the validity of the assumptions. Given these considerations it is worth reproducing the EFD index including new countries and years, in order to establish to what extent these assumptions hold. Moreover, if the EFD index is an indicator of net lending, it is to be expected that the assumptions of invariability of the index do not necessarily hold, as the EFD index will be subject to the same factors that influence the evolution of net lending.

6.2.2. Reproduction of the EFD index

As discussed in Chapters 1 and 2, one of the objectives of this research is to calculate the values of the EFD index extending the analysis to seven countries and embracing a period

that runs from 1980 to 2015. This step is needed to verify the validity of the assumptions of stability of the EFD index over time and between countries.

Methodologically, the main idea is to replicate the original estimations of Rajan and Zingales following as closely as possible the steps employed by the two authors in their paper.[41] As in the original calculation, the estimations realised here take the values of cash flow and capital expenditure for each firm were calculated over a period of ten years (six years in the case of the last period, 2010-2015) in order to reduce fluctuations that may arise from temporary shocks. After estimating the individual company-level of the EFD index over a decade, the industry EFD value is calculated as the median of the firm-level EFD values in each period.[42]

A difference with the original calculation lies in the industrial classification followed in the analysis. In this study industries are organised following the SIC 1987 system, while the original paper by Rajan and Zingales employed the ISIC classification. This difference is due to the data sources employed (Worldscope and Compustat), that provide data according to different industrial classifications. This implies that the industry level EFD index obtained here are not strictly comparable with those of Rajan and Zingales. This aspect, however, does not harm the validity of the analysis, as one of the objectives is to test the assumptions (widely shared by the literature that employs the EFD index) of stability of the index over time and between countries. If these assumptions are valid, it is to be expected that the sectoral values do not vary significantly across countries and space, also using the SIC1987 industrial classification.

As in Rajan and Zingales, the analysis focuses on NFC only. Table 20 below shows the 26 industries employed in the analysis. Twenty industries belong to Manufacturing, while the remaining six sectors are represented by Primary, Mining, Construction and Services (Transportation and Public Utilities, Wholesale and Retail Trade).

[41] Note that the Worldscope variables employed are in the replication of the EFD index are: WS04201, WS04825, WS04826, WS04827, WS04601. These variables are the same employed by Kroszner et al. (2007) in their estimations.

[42] Observations the top and bottom 5% of distribution were winsorized to deal with the presence of outliers.

Table 20. Industry classification.

SIC1987 Code	*Industry – Extended name*	*Industry – Shortened name*
0700-098\	Agriculture, forestry and fishing	Primary
1000-149\	Mining	Mining
1500-179\	Construction	Construction
2000-2099	Food and Beverages	Food
2100-2140	Tobacco Products	Tobacco
2200-2299	Textiles	Textiles
2300-2399	Fabricated textiles	Other textiles
2400-2499	Lumber and Wood Products	Wood
2500-2599	Furniture	Furniture
2600-2699	Paper products	Paper
2700-2799	Printing and Publishing	Printing
2800-2899	Chemicals	Chemicals
2900-2999	Petroleum and coal products	Petroleum
3000-3099	Rubber and Plastic	Rubber
3100-3199	Leather products	Leather
3200-3299	Glass	Glass
3300-3399	Primary Metal products	Basic metals
3400-3499	Fabricated metal industries	Fabricated Metals
3500-3599	Industrial machinery and equipment	Machinery
3600-3699	Electronic & other electric equipment	Electronic
3700-3799	Transportation equipment	Transp. equipment
3800-2899	Instruments and related equipment	Instruments
3900-3999	Miscellaneous industries	Other manufacturing
4100-497\	Transportation and Public Utilities	Tr. and Public Utilities
5000-519\	Wholesale trade	Wholesale
5200-599\	Retail trade	Retail

Similarly to the analysis of corporate net lending, there are some aspects concerning data availability to consider. The number of observations for changes in receivables, payables and inventories reported by Worldscope (needed in the construction of the cash flow variable) is low during the 1980s.

In order not to lose a consistent number of observations, the sum of these three elements for those years with no observations were given a value of zero. Figure 19 in the Appendix indicates that there are no relevant differences between the evolution of cash flow including and omitting changes in receivables, payables and inventories. This aspect suggests that the omission of the changes of receivables, payables and inventories, in those years for which there are no observations, does not significantly affect the volume of cash flow and, therefore, the values of the EFD index.[43]

[43] As a further test, the EFD index was calculated omitting changes in receivables, inventories and payables for all observations (even where data were available) and the results obtained with this procedure were compared with those that included changes in receivables, inventories and payables. The two series of the EFD

As a first approximation to the new estimations of the index, Figure 15 illustrates the evolution of the average values for the 26 industry values of the EFD index in G7 countries. There are two important aspects that can be highlighted from this figure. The first one is that the average values of the industry EFD index are negative throughout the four periods analysed. This pattern is common to all G7 countries, with only few exceptions, represented by Japan in the 1990s and Canada in the 2000s and between 2010 and 2015. The second aspect is that in most countries the EFD index tends to become increasingly more negative.[44] This trend is partially interrupted in the period 2000-2009 when the average of the index gets closer to zero in all countries except Japan. This effect can be imputed to the role played by the global crisis that affected the volume of cash flows of firms more than it affected their capital expenditure, leading to an increase in the values of the index. This assertion is tested by calculating the average values of the EFD index excluding the years 2008 and 2009 from the calculation. As showed in Figure 20 in the Appendix, the average values of the EFD index are lower when excluding the years of the peak of the Global Financial Crisis, which allows a conclusion that most of the upswing in the average value of the EFD index in the period 2000-2009 was due to the effect of the Global Financial Crisis.

These two aspects are of critical importance for this research as they imply that, according to Rajan and Zingales definition of EFD, industries that record negative values of the index are virtually *not* financially dependent from external financial sources, since a negative index indicates that the level of cash flow is higher than the expenditure in capital expenditure. In other words, firms tend to generate enough cash flow to cover their capital expenditure. Moreover, the variability of the trend of the EFD index represents a preliminary evidence that disputes the idea of stability of the index across countries and time. According to the assumption of stability of the index over time the average values of the EFD index are supposed not to fluctuate significantly, contrary to what is depicted in Figure 15.

index show a high correlation for all period and countries, which leads to conclude that the presence of missing values for changes in receivables, inventories and payables do not have a significant impact on the values of the index.

[44] The only two countries where the average values of the EFD index increase are France and Canada. In France these values increase after the 1990s, although the average values are always negative. In Canada the pattern is more evident, as the values become positive in the last two periods.

Figure 15. Evolution of the industry average values of the EFD index.

Source: Author's calculations using Worldscope data.

As mentioned in the previous subsection, given the formulas of corporate net lending (i.e. Savings – Capital Expenditure) and the EFD index (i.e. 1 – Cash Flow/Capital Expenditure) and in light of the similarity between savings and cash flow, a rise in net lending should correspond to a *decrease* in the EFD index. This inverse relationship seems to be broadly confirmed by Figure 15. The general rise of corporate net lending coincides with the decrease in the average values of the EFD index.

To provide a more detailed picture, Table 21 presents the values of the EFD for the 26 industries in each country. These data confirm the general trend presented in Figure 15.[45] As mentioned above, given the different industrial classifications it is not possible to draw an exact correspondence between the results elaborated by Rajan and Zingales. However, it is relevant to stress that, in contrast to the original estimations, the EFD index tends to be

[45] Some cells are empty because of the lack of observations for some industries.

negative for most of the industries. This pattern is shared by all countries, as the industries that record a negative index are the great majority in most of the periods.

Even though the values of the EFD index in Table 20 diverge from Rajan and Zingales estimations, they show some similarity with the alternative estimates of the EFD index estimated by Kroszner et al. (2007), reported in Table 5. Also in this case, the different classification does not allow a one to one relation with their estimates to be established, since Kroszner et al. (2007) estimate the EFD index for 38 industries (not 26 as in this study) and only focus on a limited sample of countries and years. However, there are some relevant aspects in common with this study. As in Kroszner et al. (2007), most of the industry values on the EFD index in the US for the period 1980-1999 are negative. Therefore, these authors also find that American industries tend to be more inclined not to be financial dependent on external finance than was originally highlighted by Rajan and Zingales.

Table 21. New estimations of the EFD values by industry, country and period.

	US				UK				Germany				Italy			
Industry	1980-1989	1990-1999	2000-2009	2010-2015	1980-1989	1990-1999	2000-2009	2010-2015	1980-1989	1990-1999	2000-2009	2010-2015	1980-1989	1990-1999	2000-2009	2010-2015
Primary	-0.53	-0.28	-0.16	0.01	-0.18	-0.42	0.01	0.21	-0.07	-0.45	0.12	0.43	n.a.	-2.95	0.74	-0.10
Mining	0.00	0.22	0.58	0.62	-0.23	0.36	1.16	1.17	-0.20	-0.10	-0.65	0.76	-0.93	-1.02	-1.57	0.63
Construction	-0.39	-0.88	-0.81	-1.25	-0.28	-0.77	-0.93	-0.48	-0.07	-0.03	0.29	-0.13	-1.54	-1.46	-0.38	-3.45
Food	-0.51	-0.64	-1.34	-1.64	-0.26	-0.67	-0.93	-1.41	-0.07	-0.07	0.04	-0.55	-0.14	-0.66	-0.94	-1.63
Tobacco	-1.23	-1.46	-2.38	-3.93	-1.14	-3.31	-4.44	-7.86	-0.75	-0.44	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Textiles	-0.40	-0.57	0.29	-0.88	-0.62	-0.50	-0.22	-2.81	-0.14	0.20	-0.03	-1.62	-1.36	-0.23	0.27	-2.71
Other textiles	-1.09	-1.47	-1.46	-2.26	-0.55	-0.81	0.02	-1.77	-0.41	-0.82	-1.39	-0.93	-1.50	-1.00	0.11	-0.08
Wood	-0.23	-0.74	-0.13	-2.47	0.02	-0.55	-0.96	-3.37	-0.06	-0.39	0.08	0.36	n.a.	n.a.	0.76	n.a.
Furniture	-0.99	-1.35	-1.68	-2.25	-0.57	-0.88	-0.78	-0.40	0.47	-0.21	0.01	-1.13	n.a.	n.a.	-1.03	-0.59
Paper	-0.24	-0.32	-0.74	-1.28	-0.36	-0.65	0.02	-0.79	0.01	0.06	-0.47	-1.18	-0.74	-0.07	0.93	-0.11
Printing	-0.62	-1.55	-1.57	-1.99	-0.28	-1.03	-1.16	-2.05	-0.04	0.01	0.86	0.84	-0.47	-1.58	-0.53	1.97
Chemicals	-0.73	-0.74	1.00	-0.31	-0.52	-0.62	0.41	-0.95	-0.35	-0.33	-0.21	-0.40	-0.79	-0.22	-0.43	-2.88
Petroleum	-0.32	-0.23	-0.55	-0.38	-0.14	-0.55	1.69	-0.12	-1.43	-1.03	-0.17	-0.77	n.a.	0.37	-1.11	-0.58
Rubber	-0.70	-0.71	-0.49	-1.04	-0.26	-0.62	-0.25	-1.49	0.00	-0.22	-0.59	-1.92	-1.26	-0.41	-0.91	-0.87
Leather	-0.80	-2.03	-3.13	-4.30	-0.43	0.09	1.81	-2.25	n.a.	-4.75	0.61	-1.39	n.a.	n.a.	-2.99	-3.27
Glass	-0.40	-0.65	-0.47	-0.52	-0.26	-0.47	-0.55	-1.80	-0.20	-0.16	-0.33	-0.64	-0.54	-0.84	-0.80	-0.32
Basic metals	-0.19	-0.34	-0.91	-0.90	-0.39	-0.63	-0.67	-1.55	-0.14	-0.08	-0.38	-0.47	-0.32	0.09	-1.36	-0.80
Fabricated Metals	-0.79	-1.00	-1.37	-2.17	-0.74	-0.93	-1.61	-2.04	-0.28	-0.07	-0.20	-0.73	-0.80	-0.39	-0.88	-0.89
Machinery	-0.45	-1.20	-0.99	-1.73	-0.59	-0.87	-0.40	-1.80	-0.22	-0.35	-0.56	-1.77	-0.25	-1.27	-0.65	-1.32
Electronic	-0.33	-0.92	-0.20	-1.11	-0.69	-0.84	-0.17	-1.02	-0.04	-0.13	0.10	-0.74	-0.08	-1.79	-1.13	-1.18
Transp. equipment	-0.46	-0.95	-0.66	-1.57	-0.08	-0.86	-0.18	-1.62	-0.05	-0.20	-0.38	-1.00	-0.50	-0.63	-0.36	-0.44
Instruments	-0.58	-1.15	-0.56	-1.60	-0.62	-1.10	-0.13	-1.31	-0.05	-0.30	0.30	-1.11	-0.48	0.35	-0.82	-1.99
Other manufacturing	-0.77	-1.16	-0.64	-1.98	-0.83	-0.39	0.62	-1.27	-0.64	-0.73	-0.68	0.08	n.a.	-3.97	-2.93	7.48
Tr. and Public Utilities	-0.04	-0.18	-0.16	-0.19	-0.04	-0.31	-0.12	-0.28	0.00	-0.27	-0.30	-0.23	0.01	-0.23	0.13	-0.29
Wholesale	-0.60	-1.18	-0.87	-1.74	-0.45	-1.17	-0.66	-3.00	-0.20	-0.13	-0.15	-0.50	0.10	-0.61	1.14	-1.10
Retail	-0.11	-0.39	-0.41	-1.06	0.01	-0.26	-0.27	-0.82	-0.30	-0.29	0.04	-1.04	0.15	0.32	-1.36	-3.02
Average	-0.52	-0.84	-0.76	-1.46	-0.40	-0.72	-0.33	-1.57	-0.21	-0.43	-0.16	-0.63	-0.60	-0.83	-0.64	-0.73
N. of Ind. with EFD > 0	1	1	3	2	2	2	8	2	3	3	10	5	3	4	7	3

Note: Each value is the median of the firm-level EFD index in a certain industry.
Source: Author's calculations using Worldscope data.

	France				Japan				Canada			
Industry	1980-1989	1990-1999	2000-2009	2010-2015	1980-1989	1990-1999	2000-2009	2010-2015	1980-1989	1990-1999	2000-2009	2010-2015
Primary	-0.16	-0.20	0.30	-0.03	0.12	-0.15	-0.03	-0.47	n.a.	-2.87	-0.39	-0.47
Mining	-0.22	0.05	-0.97	0.28	-0.34	0.34	-0.15	-0.38	0.12	0.50	1.27	1.66
Construction	-0.10	-0.44	-0.65	-0.76	-0.38	-0.12	0.28	-1.38	0.25	-0.92	-0.52	-0.05
Food	-0.66	-0.54	-0.48	-0.70	-0.31	0.10	-0.46	-0.96	-0.47	-0.52	-1.16	-0.81
Tobacco	n.a.	n.a.	n.a.	n.a.	n.a.	-0.17	-1.56	-3.13	-0.19	n.a.	5.81	3.54
Textiles	-0.10	0.12	-0.34	2.12	-0.80	0.35	0.49	-0.54	-0.43	0.01	-1.06	-1.25
Other textiles	-1.12	-0.60	-0.73	-0.66	-1.19	-0.12	0.12	-1.08	-0.13	-0.65	-0.50	0.23
Wood	0.01	-0.99	-0.06	-0.51	-0.53	-0.17	-0.26	-1.18	-0.13	-0.32	0.14	-0.58
Furniture	-0.44	-1.27	-0.28	-1.46	-0.43	0.59	-0.23	-1.94	n.a.	-0.11	-0.58	0.82
Paper	0.14	-0.11	-0.14	-0.26	0.68	0.00	-0.29	-0.61	0.20	-0.19	-0.40	-1.06
Printing	0.00	-0.89	-0.42	0.97	-0.15	-0.08	-0.46	-1.14	-0.53	-0.66	-0.69	-1.69
Chemicals	-0.51	-0.53	-0.96	-0.47	-0.23	-0.03	-0.58	-1.44	-0.61	-0.34	1.56	3.12
Petroleum	-0.17	-0.29	-1.15	0.95	-0.28	0.01	-0.79	-0.88	0.09	0.03	-0.23	0.75
Rubber	-0.24	-0.30	-0.29	-0.80	0.00	0.21	-0.28	-1.02	0.20	-0.09	-0.17	-1.40
Leather	-0.59	-1.94	0.59	0.34	-0.53	0.47	-0.89	-3.25	n.a.	-0.44	1.32	n.a.
Glass	-0.67	-0.41	-0.57	-0.49	0.00	0.04	-0.04	-0.81	-0.19	-0.33	0.39	-1.92
Basic metals	-0.39	-0.23	0.11	-0.74	-0.13	0.41	-0.38	-0.86	-0.15	-0.08	-1.28	1.46
Fabricated Metals	-0.59	-0.16	-0.25	-1.25	-1.67	-0.02	-0.08	-1.35	-0.57	-1.12	-0.99	-0.64
Machinery	0.04	-0.80	-0.47	-1.44	-0.12	0.08	-0.60	-1.40	-0.36	-0.30	-0.45	2.70
Electronic	-0.41	-0.59	-0.11	-0.19	-0.16	-0.16	-0.17	-0.76	-1.01	-1.27	0.72	0.88
Transp. equipment	-0.15	-0.70	-0.59	-1.18	-0.03	0.11	-0.15	-0.78	-0.48	-0.38	-0.35	-0.55
Instruments	-0.44	-0.88	-0.70	1.89	-0.10	-0.25	-0.61	-1.34	-0.24	-0.88	3.86	8.97
Other manufacturing	-0.65	-0.66	-0.42	-0.28	-0.33	0.06	-0.48	-1.60	n.a.	-1.03	-1.13	-0.65
Tr. and Public Utilities	0.13	-0.06	-0.14	-0.28	0.25	0.19	-0.21	-0.50	0.12	-0.02	0.02	0.02
Wholesale	-0.28	-0.81	-0.29	-0.95	-0.28	0.30	-0.81	-1.78	-0.58	-0.57	-0.74	-0.42
Retail	-0.04	-0.17	-0.15	-0.30	0.14	0.15	-0.32	-0.86	-0.07	-0.13	-0.89	-1.09
Average	-0.30	-0.54	-0.37	-0.25	-0.27	0.08	-0.34	-1.21	-0.23	-0.51	0.14	0.46
N. of Ind. with EFD > 0	5	2	3	6	6	16	3	0	6	3	9	11

Note: Each value is the median of the firm-level EFD index in a certain industry.
Source: Author's calculations using Worldscope data

From the results presented so far, there are different elements of interest that emerge. The EFD seems to be an equivalent measure of corporate net lending. This is evidenced by the similarity between the definitions of corporate savings and cash flow and by the evolution of these variables that follows a twin pattern. Moreover, there is a generalised decreasing trend (Figure 15 and Table 21) in the values of the EFD which is consistent with the rise in corporate net lending. At the same time, the negative values of the EFD index indicate that firms are virtually not dependent on external finance to cover their capital expenditure as the cash flow generally exceeds investment.

A possible counterargument might be that what really matters is not the absolute values of the index, but the ranking of the industries, from least to most dependent. This aspect relates to the assumptions of stability of the EFD between countries and over time. Hence, if these assumptions are valid, it is to be expected that:

- The ranking of the EFD index of the industries in a certain period is similar across countries.
- The ranking of the EFD index of the industries within the same country does not vary significantly from one period to the following.

These two assertions are tested, respectively, in Table 22 and Table 23 below. Table 22 shows the correlation coefficients of the simple regression of the industry values of the EFD index in each country against the values obtained for of the US in the same period. American industries are taken as reference because the literature on EFD considers them to be a good proxy for other countries' EFD (as discussed in Section 2.5 above). Rajan and Zingales (1998, pp. 565–567) argued that given the different degree of maturity of the industry in different countries, the employment of values of the EFD index for American firms in the 1970s would be more appropriate to grasp the reality of developing countries. However, since the analysis in this work involves only countries with similar degrees of development, it is safe to compare values of the EFD index obtained in the same decade. If the assumption of stability of the EFD index across countries holds, it is to be expected that the coefficients of correlation between the two series of values will be positive and highly significant, and the R-squared to be close to one.

The results presented in Table 22 indicate that there is a high heterogeneity between coefficients of correlation. A consistent number of coefficients is not statistically significant, indicating that there is no correlation between the industry EFD in the US and that in the country under analysis. The UK and Japan are the countries where there is the highest degree

of positive correlation with American values. Here, three of the four coefficients are statistically significant. In France, the first and second period show a positive relationship with American firms, while the third records a negative and significant coefficient. This peculiar outcome implies that in that period the ranking of EFD by industries tended to be the opposite in France with respect to the US, which contradicts the assumption of analogous ranking in the industry EFD. As to the remaining countries, the values of the EFD index in Germany and Italy show little correlation with the American values, being significant only in one period (Germany, at 5%) and two periods (Italy, at 10%). Finally, the values of the EFD values obtained for Canadian industries are not significant in any of the periods analysed.

Table 22. Simple regression coefficients between US EFD index and other countries' EFD index by period. R-squared in parenthesis.

	1980-1989	1990-1999	2000-2009	2010-2015
UK	0.761***	0.345**	0.229	0.475***
	(0.460)	(0.178)	(0.094)	(0.495)
Germany	0.103	0.268**	-0.456	0.381
	(0.013)	(0.231)	(0.064)	(0.078)
Italy	0.209*	0.118	0.269*	0.0105
	(0.162)	(0.077)	(0.114)	(0.001)
France	0.618***	0.933***	-0.883**	0.163
	(0.445)	(0.699)	(0.180)	(0.023)
Japan	0.317***	0.0984	0.971**	1.319***
	(0.266)	(0.002)	(0.207)	(0.722)
Canada	0.266	0.154	-0.0861	-0.0456
	(0.078)	(0.038)	(0.025)	(0.012)

***** significant at 10%; ****** significant at 5%; ******* significant at 1%

Overall, out of 24 coefficients, only 10 coefficients record a positive and statistical significance (only 6 of them at 1%). Moreover, the size of the coefficients and of the R-squared is often far from the unity, which indicates a poor fit of the two series. Importantly, the degree of statistical significance reduces with time. During the 1980s, four of the six countries record a significant correlation with American values, while this number decreases to three in the 2000s and two during the 2010s. This aspect implies that, different from the original assumptions, the industries of different countries do not converge towards similar levels of EFD but show a divergent trend. This evidence implies that the assumption of constancy of the index in time finds little support in the data. Note that this analysis regards listed NFC of developed countries, where it is plausible to assume little or no barrier to

access to financial markets. Hence, it is possible to exclude the possibility that the results could be driven by a different development of the financial markets in the countries of the sample. If it is not possible to find a solid relationship between the EFD values obtained for countries with a comparable degree of development as it is the case of G7 members, it is likely that this discrepancy would hold for less developed countries. Furthermore, the fact that the correlation with American values decreases in time contrasts with the argument that industries across countries tend to converge in time.

These results lead to conclude that the assumption of stability of the index across countries finds little or no evidence from the replication of the index in G7 countries. These aspects suggest that, within the sample of listed NFC corporations there is a high heterogeneity of the ratio of cash flow over capital expenditure across different countries.

To test the assumption of stability in time of the index, Table 23 shows the values of the coefficients of correlation of the simple regression between values of the EFD index in subsequent periods and in the same country. As in the previous case, if the assumption of invariability of the index is valid, it might be expected that one would find coefficients that are close to the unity, to be highly significant and to have a high R-squared. This would imply that the degree of industry EFD does not vary significantly from one period to the other and that the industry ranking does not change considerably in time.

Table 23 shows that effectively there is a high degree of correlation in the US and in the UK. In these countries, the industry values of the EFD index of one period with the following one are always statistically significant, indicating a relative stability in the industry ranking of EFD. In the rest of the countries, however, the scenario is quite different. In Canada, the first and last coefficient are significant while Germany and Japan display significant coefficients only in one case, respectively from the 1980s to the 1990s and from the 2000s and the 2010s. Note that when significant, the values of the coefficients of correlation tend to be, in most of the cases, far from the unity and usually take values around 0.4-0.5. Also, the R-squared often shows values below 0.5, which suggests a relatively poor fit for two series of values that, according to the EFD literature, are expected to show a high degree of similarity. Finally, the EFD values obtained in Italy and in France present no correlation from one period to the other.

This polarisation in the results leads to the conclusion that the assumption of stability of the EFD in time holds, to a certain extent, in some countries, but it fails to be valid as a general rule, as most of the, coefficients (10 over 21) are not statistically significant. It can be added

that it is the very concept of "maturity" that needs to be reconsidered. A steady stage of "maturity" can be obtained within a static environment, without technical change. However, as technical change operates continuously (and at different paces) in all industries, industries are constantly changing their technique of production so that there is no reason to believe the ratio of cash flow over investment will be steady. In conclusion of this subsection, it can be affirmed that the assumptions of stability of the EFD index between countries and in time finds either partial or no support.

Table 23. Simple regression coefficients between the industry values of the EFD in subsequent periods in the same country. R-squared in parenthesis.

Period	US	UK	Germany	Italy	France	Japan	Canada
1980s to 1990s	0.467*** (0.590)	0.268*** (0.367)	0.861*** (0.485)	0.130 (0.023)	0.179 (0.071)	-0.0424 (0.000)	0.442*** (0.312)
1990s to 2000s	0.436*** (0.545)	0.458*** (0.714)	-0.468 (0.051)	0.273 (0.055)	-0.332 (0.083)	0.0260 (0.002)	0.00645 (0.000)
2000s to 2010s	0.668*** (0.717)	0.520*** (0.535)	0.126 (0.041)	-0.113 (0.060)	-0.0513 (0.014)	0.390*** (0.464)	0.508*** (0.518)

***** significant at 10%; ****** significant at 5%; ******* significant at 1%

6.2.3. Comparison between the EFD index and corporate net lending

Section 6.2.1 discussed the resemblance between the concepts of EFD index and corporate net lending. It was shown that both compare an indicator of liquidity of the firm with capital expenditure, and that the main difference between them resides in the variable of liquidity of the firm employed. Hence, the definitions of savings and cash flow were compared, and it was asserted that they bear a high degree of similarity. Accordingly, Figure 14 shows that the evolution of average savings follows very closely that of cash flow. These considerations motivate the following analysis, that explores the empirical relation between EFD and net lending.

In order to test the relation between the EFD index and corporate net lending, a new version of the EFD index was developed:

$$EFD\_2_i = \frac{(KE_i - Savings_i)}{KE_i} = 1 - \frac{Savings_i}{KE_i} \qquad (14)$$

This formula differs from the original one (equation 12) only with respect to the unit of liquidity, which in this case is corporate savings. Like corporate net lending, equation (3) relates savings to capital expenditure. However, different from the standard formulation of

corporate net lending, this equation sets up the relation between savings and investment as a ratio, not as the subtraction of capital expenditure from corporate savings. Despite these modifications, the standard calculation of net lending and equation (14) can be considered to grasp the same phenomenon. In the case of EFD_2, an increase in corporate net lending is manifested in the rise of the ratio of savings over capital investment, leading to a decrease of the values of EFD_2.

After calculating EFD_2 for all 26 industries, the coefficients of correlation between the standard EFD index and EFD_2 were estimated. If the two measures are different, the statistical correlation between the series is expected to be low. On the contrary, a high degree of correlation indicates that the indexes ultimately grasp the same phenomenon. As expected in light of the previous discussion, the coefficient of correlation between the standard EFD index and EFD_2 (Table 24) are strongly significant in all G7 countries for all periods.[46] Several values are above 0.8 indicating that the values of the index calculated, by employing cash flow, are almost equivalent to the values employed using corporate savings following equation (14).

Table 24. Simple regression coefficients between firm-level values of the EFD in each period. EFD_2 vs. standard EFD index. R-squared in parenthesis.

Period	Full Sample	US	UK	Germany	Italy	France	Japan	Canada
1990-1999	0.734*** (0.546)	0.738*** (0.542)	0.801*** (0.646)	0.749*** (0.614)	0.414*** (0.463)	0.628*** (0.642)	0.729*** (0.768)	0.885*** (0.625)
2000-2009	1.174*** (0.686)	1.217*** (0.684)	1.126*** (0.713)	0.853*** (0.491)	0.679*** (0.744)	0.938*** (0.871)	0.579*** (0.344)	1.231*** (0.802)
2010-2010	1.197*** (0.717)	1.223*** (0.759)	1.163*** (0.722)	0.973*** (0.556)	0.864*** (0.604)	1.027*** (0.830)	0.629*** (0.524)	1.342*** (0.675)

***** significant at 10%; ****** significant at 5%; ******* significant at 1%

These results are critical, as they provide statistical support to the argument presented in Section 6.2.1 regarding the theoretical similarity between net lending and the EFD index, so that it can be concluded that EFD index is fundamentally a proxy of corporate net lending.

[46] Given the lack of data for the calculation of the EFD_2 during the 1980s, this decade was omitted.

6.3. Summary

This chapter has assessed the concept of EFD and how it relates to the rise of corporate net lending. The EFD index has been calculated for seven developed countries embracing a period of 35 years. This elaboration has been accompanied by a critical assessment of the EFD index and of the assumptions behind the original contribution developed by Rajan and Zingales, and by the rich literature that has employed the index.

It has been argued that the EFD index is an indicator of corporate net lending, rather than a measure that captures structural and unchangeable features of the industries' EFD, as in the original elaboration of the index. Two main arguments were provided in support of this assertion. To start with, the analytical formulation of the EFD resembles closely that of corporate net lending. The only substantial difference between the two measures lies in the variable of liquidity of the firms employed, i.e. cash flow vs. corporate savings. It has been demonstrated that the accounting definitions of these variables are very similar, as well as their evolution during the period under scrutiny. Departing from this consideration, a new version of the EFD index has been developed, employing savings, instead of cash flow, as the indicator of liquidity of the firm. The values of the new version of the index created, following this criterion, resembles very closely the original as shown by the correlation coefficients between the two series (Table 24) These findings support the argument that net lending and the EFD index are substitute concepts.

In addition, the chapter has presented the results regarding the estimation of the EFD index for 26 industries in G7 countries between 1980 and 2015. This represents a substantial contribution to the literature, as it expands the existing calculations that are generally confined to a limited number of years and countries. The new estimation of the EFD index is also useful to highlight additional aspects. First, the index is prominently negative, indicating that, accordingly to the definition of EFD employed by Rajan and Zingales, industries are largely not dependent on external finance, since their cash flow is enough to cover their investment. Moreover, there is a tendency to become, on average, increasingly less dependent, which is consistent with the rise in net lending recorded in the last decades. Second, the assumption of invariability of the index over space and time finds little or no support in the empirical tests. The values of EFD index obtained for American firms do not seem to be a valid proxy for the EFD in other G7 countries. Only in a minority of cases the relationship between cross-country values of the EFD index is statistically significant. What is more, the correlations tend to disappear in more recent periods, being more significant

during the 1980s than in the 2000s and 2010s. Furthermore, the assumption that the EFD does not vary significantly over time because the structural technological characteristics of the industry seems to be weak. Only the US and the UK display a significant relationship of the index from one period to the following, while the rest of the countries record very little or no statistical significance.

Overall, it can be concluded that the EFD index is, ultimately, a proxy of corporate net lending. Both indexes grasp the capacity of the firms to finance their capital expenditure via internal funds. However, the fundamental idea that the EFD index is a measure that captures structural and steady features of the industry is jeopardised. This evidence has potentially important consequences for the literature that employs the EFD index. This index should not be considered as a measure that captures the external financial dependency of the firms determined by embodied and invariable technological features of the industries. Authors that want to include measures of financial dependency should be aware that a consistent part of the corporate sector is virtually not dependent on external finance. Additionally, the discussion about the determination of the values of this index should be subject to the same debate on the causes that determine the evolution of net lending. What is more, the use of the EFD index estimated by Rajan and Zingales (and widely employed in the literature) does not seem adequate to grasp the reality of countries different from the US. The empirical re-estimation of the index indicates that it is not possible to claim that American values of the EFD index, obtained in 1980s, are universal indicators that can be applied to other countries in different periods. Scholars should consider these findings if they decide to include the concept of EFD in their research.

In conclusion, our results imply that the theoretical interpretation as well as the empirical application of the EFD index should be carefully reconsidered. One possibility is to abandon the current formulation of EFD. An intermediate possibility may be to reconsider the nature of the EFD index, not as a measure that uniquely reflects technological aspects, but as an indicator that can be influenced by different aspects and, importantly, can vary in time and across different countries. An additional option is to update the formulation of the EFD index. This new formulation should take into account that a consistent number of firms is virtually not dependent on external finance. Possibly, a new formulation of the EFD index can be focused at measuring the needs of those firms that are dependant on external finance, i.e. where their capital expenditure exceeds cash flow (or any other measure of liquidity employed), without focusing on firms whose internal funds are adequate to cover their capital expenditures.

CHAPTER 7. Conclusions

7.1. Introduction

This chapter concludes the dissertation by summarising and discussing the main aspects that have emerged in this research. The next subsection addresses the research objectives delineated in Chapter 1 and provides a more general assessment that can be derived from the results of this study. As in every research project, there are some limitations that should be explicitly stated. These shortcomings are discussed in Section 7.3. Lastly, some final remarks and the presentation of possible future avenues for research conclude this dissertation (Section 7.4).

7.2. Contribution to knowledge

Prior to addressing the research findings in relation to the research objectives it is relevant to resume the origin and justification that motivated this research. This thesis has assessed the emergence of corporate net lending among G7 countries between 1990 and 2015, focusing on a sample of more than 23,000 listed NFC. As highlighted at the beginning of this research (Chapter 1), this topic has attracted the attention of different media and academic scholars. Corporate net lending has emerged in the last decades as a characteristic aspect of developed countries. This motivated a growing literature that attempted to establish the possible causes behind this phenomenon (Section 2.3). Despite the increasing attention on this topic, different hypotheses explored so far by the literature find little empirical support. This leaves considerable space for additional research aimed at determining the factors that contributed to mounting levels of net lending. This research has addressed this gap, exploring the possible role occupied by the process of financialisation and functional income distribution.

The relevance of the topic does not rest uniquely on the determination of the causes behind net lending. The thesis has assessed the notion of net lending from its theoretical foundations, i.e. as a measure that links a measure of internal funds of the firm with capital investment and has related it to similar efforts in the literature. The shift in the financing role of corporations, from net borrowing to net lending position, implies a modification of the traditional role of the firms towards being a net provider of funds to the rest of the economy. This aspect potentially opens the floor to numerous implications for economic analysis. In this sense, the thesis has engaged with the concept of External Financial Dependence, which

found popularity in the academic milieu following the contribution of Rajan and Zingales (1998).

From these considerations, four research objectives and different research questions associated to each one of them have been formulated (Section 1.3) and addressed in this dissertation. The remaining part of this section assesses each one of these objectives in relation to our findings.

- *Objective 1*: *Describe and characterise the evolution of net lending among listed NFC of G7 countries between 1990 and 2015.*

The descriptive analysis proposed in Chapter 4 was designed to address *objective 1*. Embracing a period of 25 years, the study allows us to observe the evolution of corporate savings, physical investment and net lending among listed NFC of G7 countries. *Per se*, this assessment adds to the literature by providing extensive figures over a time frame and spatial coverage that has thus far been unexplored in the literature.

The most relevant aspect that emerges from this analysis is that there is a considerable increase in corporate net lending in all countries, apart from Canada.[47] Within the general trend of growth of net lending it was possible to distinguish between two sub-periods, 1990-2001 and 2002-2015. The first sub-period is generally characterised by low and steady (or slowly growing) levels of net lending. This trend contrasts with the following sub-period, when net lending sharply increased. From 2001 a clear misalignment between the evolution of savings and investment is reported, with the consequent growth of net lending. This is because in most of the countries savings increased faster in the second sub-period than in the first one, while capital expenditure lagged behind. As a consequence, the average values of net lending increased several times from the first sub-period to the second one. This growth is interrupted during the years of the Global Financial Crisis, mostly because of the fast drop in corporate savings. However, this halt has not reverted the trend. In the aftermath of the Global Financial Crisis the levels of net lending recovered in most

[47] This has to be imputed to the high participation of Mining firms in Canadian listed NFC (approximately 60% of total observations) and to the fact that Mining companies tend to be net borrowers compared to other firms in other industries.

of the G7 countries. The levels of net lending in the period 2010-2015 in some countries (US, Germany) exceed those recorded in the pre-crisis years.

These findings provide useful evidence to the existing literature on net lending and support the view that net lending is becoming a structural phenomenon of contemporary capitalism (Dao and Maggi, 2018) and not a temporary anomaly that characterised the beginning of the century, as argued by other authors (e.g. Gruber and Kamin, 2016). The emergence of net lending has contradicted the idea of the corporate sector as net demander of funds. If this pattern will be confirmed by future studies, it would represent an aspect of great importance for economic analysis since the corporate sector will have to be considered a net provider of funds to the rest of the economy.

Finally, the descriptive figures have highlighted that the increase in net lending is not distributed evenly across firms. In all countries, the level of net lending is directly related with the size of the firm. This is valid both in absolute terms (US$) and relatively to total assets of the firm. Furthermore, it appears that this polarisation has deepened with time. In fact, the distance in the ratio of net lending over total assets between bottom and top quintiles increased between the two sub-periods. These findings suggest caution when addressing net lending. Although the shift is evident in our sample of firms, this has been mostly determined by bigger firms.

- *Objective 2: Evaluate the role of the process of financialisation and functional income distribution in the level of corporate net lending.*

Chapter 2 of the thesis discussed the novelty represented by the recent rise in corporate net lending. Assessing the literature on the theoretical and empirical evidence concerning the causes of the rise of net lending, it was stressed that there is a substantial space for additional contributions, given that different hypotheses explored so far by other authors find limited empirical support. In an attempt to fill these gaps, the thesis focused on two aspects that had not been explored by the existing literature, namely the role of financialisation and functional income distribution. The theoretical modalities through which these two channels can impact on the level of net lending were developed in Section 2.4. These channels were then tested in the subsequent chapters, providing descriptive (Chapter 4) and econometric evidence (Chapter 5) of their link with the level of net lending.

Drawing from the literature on financialisation, it was argued that at least two interrelated drivers, the maximisation of shareholder value (Froud et al., 2000; Lazonick and O'Sullivan, 2000, among others) and the negative impact of financialisation of corporate investment (Orhangazi, 2008; Tori and Onaran, 2018, among others), acted as vehicles to the rise of corporate net lending. The maximisation of shareholder value contributed to redefine the objectives of the firm. Under this regime of accumulation, real growth of output becomes complementary to the satisfaction of shareholders' interests. One consequence of this process is that firms tend to increase the volume of financial payouts disbursed and, simultaneously, increases the pressure towards the maximisation of returns in the short run and the desire of managers to boost stock prices drain resources that otherwise could be employed in longer-term investment projects. As a result, investment is negatively affected by the process of financialisation. In light of this model of firm governance, a positive link was theorised between financialisation and net lending (Section 2.4.1).

As to the econometric findings, tests performed in Chapter 5 broadly support this theoretical mechanism. Financial payouts (total payouts, dividends and buybacks) are positively related with corporate net lending for the full panel of firms. These findings shed new light on the link between financial payouts and net lending and provide further support to the literature that stresses the negative link between financialisation and capital accumulation (Orhangazi, 2008a, 2008b; Davis, 2018; Tori and Onaran, 2018b, 2018a).

Although this evidence confirms the theoretical link between financial payouts and net lending depicted in this dissertation, there are important aspects that emerge from the econometric analysis and need to be addressed. To begin with, financial payouts do not play a significant role during the first sub-period (1990-2001). These results bear some similarity with other studies on financialisation (e.g. Stockhammer, 2004) that cover a similar time span and that find limited effect of financialisation in some countries during the 1990s. It is in the second sub-period (2002-2015) that average financial payouts soared and when financialisation practices grew considerably also in countries that had been previously not particularly involved (e.g Berghoff, 2016 on the German case). The second sub-period also coincides also with the liberalisation of the legislation that, in Europe, allowed firms to buy back their shares (Kim, Schremper and Varaiya, 2005) which contributed to the diffusion of the shareholder ideology (Sakinç, 2017). Despite the relatively lower use of this

instrument in European countries compared to American firms, the country level results show that share repurchases have a positive and significant sign in all European countries and tend to be more significant than dividends. With respect to non-European countries, net lending levels of Japanese firms are not affected by financial payouts. As discussed in Chapter 5, this result can be imputed to the lower level of financialisation recorded by Japanese firms during the period under scrutiny (Shabani and Toporowski, 2015). These results reveal that financialisation and its impact on the economy (in this case on net lending) is an uneven phenomenon, which has different effects over time and space.

These findings provide support to the argument of those authors that emphasise the "variegated" nature of financialisation (Hein, Detzer and Dodig, 2016; Brown, Spencer and Veronese Passarella, 2017). These scholars stress that financialisation can manifest itself differently in each country and that it should not be viewed as a uniform process. From this perspective, the econometric results highlight the general role of financial payouts on net lending but also indicate the need to be cautious when assessing each country individually.

The second channel explored is functional income distribution. Previous literature has found a positive link between profits and corporate net lending (e.g. Cesaroni et al., 2017; De Souza and Epstein, 2014) but, so far, no studies have explored the relationship between functional income distribution and net lending at the firm-level. The preliminary evidence of this link was offered in Chapter 4, which shows that the average labour share tends to be higher among firms in the bottom quintile of net lending values compared to firms at the top quintile. As for the level of net lending, this polarisation increases between the first and the second sub-period, in concomitance with the reduction of the wage share at the country level as well as in the sample of firms employed in this study.

The negative relationship between wage share and net lending is confirmed in the econometric analysis for all the variables of interest, both at the firm and country level. As to this last dimension of analysis the negative link between functional income distribution at the country level (*LABSHARE*) and firms' net lending supports the idea that higher profit shares have a higher impact on corporate savings than they have on capital expenditure, in line with other findings performed at the aggregate level (Behringer and van Treeck, 2018). These findings hold in each sub-period and

for all individual countries, indicating a generalised negative relationship between the wage share and net lending.

Once it has been established that functional income distribution impacts on the level of net lending, the debate on the causes on the determination of the wage (and profit) share becomes relevant for the analysis of corporate net lending. Section 2.4.2 summarised the main discussion in the literature on the factors that influence the labour share. It was contended that the argument that assigned this relationship to technical issues (related to the variation in the elasticity of substitution between productive factors) suffers from theoretical and empirical flows. This paves the way to the exploration of other factors, such as power relations and bargaining power of workers (e.g. Onaran, 2011). Accordingly, the reduction in the wage share reflects the reduction in bargaining power of labour compared to capital earners. There are different causes that may contribute to fuelling this process (such as capital mobility and trade openness). What is crucial to stress in relation to this research is that, from this perspective, the possibility of firms accumulating larger amounts of savings compared to their investment, is simply the result of the fact that a (increasing) portion of output is not distributed to wage earners.

The econometric findings are robust to the inclusion of different control variables and to different tests. The role of the explanatory variables included in the regressions does not change significantly when the most common definition of net lending (*NL_TA2*, which subtracts dividends payments from corporate savings) is used as dependent variable. Also the rise in intangible capital does not interfere with the validity of the parameters associated to our variables of interest. In fact, the inclusion of intangible capital to fixed capital expenditure (*NL_TA3*), does not alter the econometric results.

- *Objective 3: Analyse the similarities and differences between measures of corporate net lending and EFD normally employed in the literature.*

On a fundamental level, the emergence of net lending reveals that the measure of internal liquidity of the firm is sufficient to cover capital expenditure, so that firms, on average, virtually do not have to rely on external finance to fund their investment. These facts contrast with the concept of EFD (Rajan and Zingales, 1998). Similarly to corporate net lending, the EFD index relates a measure of liquidity of the firm

(cash flow) with physical investment. Despite this resemblance, the scopes of the two measures (net lending and EFD index) are embedded in radically different perspectives. While it is commonly accepted that the level of net lending is not constant over time and that it can vary between countries, Rajan and Zingales (1998) and the literature that employs the EFD index considers that the industry EFD values are stable in time and space. From these contradictory aspects it emerged the necessity of exploring in detail the theoretical and empirical differences/similarities between net lending and the EFD index.

The first step to establish to what extent the EFD index is equivalent to net lending was to compare the definitions of the two measures (EFD index and net lending). This analysis reveals that the only relevant difference between the two formulations lies in the indicator of internal funds of the firm employed, cash flow versus savings. Furthermore, it was demonstrated that there are only minor differences in the composition of these two variables (Section 6.2.1), as in both cases they are mainly constituted by net income. This similarity finds support on empirical grounds. Figure 14 shows that savings and cash flow follow a similar trend between 1990 and 2015, indicating that they are highly correlated. As an additional test, Section 6.2.3 calculated a new version of the EFD index. This new version differs from the original calculation uniquely in the measure of liquidity of the firm employed, that in this case is savings (instead of cash flow). The coefficients of correlation between this measure and the values obtained following the original methodology show a high degree of correlation. From this evidence it is possible to conclude that the EFD index represents a proxy of corporate net lending, and not a measure that exclusively reflects the invariable technological features of the industries.

Once it is established that the EFD index is a proxy of corporate net lending, it can be asserted that the discussion about the factors that affect net lending becomes relevant to the literature that employs the concept of EFD. At the same time, these findings imply that the EFD index, like corporate net lending, is a dynamic measure, that fluctuates in time and may differ from one country to the other. This aspect is closely related to the next objective.

- *Objective 4: Examine the assumptions of stability of the EFD index in time and across countries*.

As discussed in detail in Section 2.5, the standard formulation of the EFD index assumes that (a) the levels of external dependency are determined by technological characteristics of the industries and (b) that the values of the EFD index do not change considerably in time and across countries. In light of (a) and (b), it can be inferred that, according to the original formulation, the "technological reasons" that determine the level of EFD are immutable.

Section 2.5.3 critically assessed this idea, maintaining that there are different factors that lead to think that the values of the EFD index should not supposed to be necessarily stable. First, it was argued that there are no theoretical reasons to believe that technological aspects persist across time and are the same across countries. Technical change modifies the type and quantity of capital employed in the production process. Hence, it seems reasonable to think that the ratio between cash flow and investment may change. Moreover, it was argued that the technology in use across different countries may differ radically during prolonged periods of time. These considerations are further justified taking into account that contemporary changes in the production processes pose additional aspects that should not be overlooked. For example, the development of automatization and the process outsourcing could affect the amount of physical capital employed by the corporate sector. All these factors can impact on the capital goods employed by the firms, influencing the ratio of cash flow to capital expenditure and therefore the EFD index.

The need for an in-depth assessment of the assumptions of stability was motivated also by other reasons. The belief that the EFD index represents immutable technological characteristics contrasts with the fact that in the original calculations from Rajan and Zingales some industries recorded values of the index above one (Table 4). Given the formulation of the index (equation (1) in Chapter 2) this outcome is possible only if the cash flow of the industry is negative. Although cash flow can be negative during a certain period, it is impossible that industries *structurally* record negative cash flow. Therefore, values of the EFD index above one can be considered, at best, as values that reflect temporary conditions of the industry. One possibility of this outcome may due to the different degree of maturity of the industries (e.g. computing in the 1980s may be consider a "younger" industry compared to others)

since, according to Rajan and Zingales (1998), young industries that are in non-mature stages of production may be more dependent on external finance. However, accepting that values of the index above a value of one are determined by a non-mature status of production of certain industries contradicts the idea that the original results obtained for American firms of the 1980s reflect steady and immutable technological features of the industries. If, therefore, an EFD index above one is the result of temporary outcome it is not possible to consider the original values of the EFD index to be constant over time.

An additional element that motivated the necessity of testing the hypotheses of stability spreads from the revision of the existing literature and specifically from those attempts to re-estimate the EFD index (e.g. Hsu et al., 2014; Kroszner et al., 2007). These estimations show a certain degree of difference with the original estimations from Rajan and Zingales, which also contrasts with the assumptions of stability of the EFD index. Finally, once it has been established that the EFD index is a close proxy of corporate net lending (see *objective 3* and Section 6.2), and given the recent evolution of the level of net lending, it is straightforward that the assumptions of stability over time and between countries, that supports the EFD index, may not be valid.

Surprisingly, there is little discussion in the literature about these assumptions and few attempts to expand the original estimations of the index. This research contributes to fill this gap, by extending the calculation of the EFD index for 26 industries in G7 countries covering 35 years, between 1980 and 2015. These estimations revealed different significant aspects.

First, the EFD index is prominently negative, implying that, according to Rajan and Zingales' definition of EFD, industries as a whole are largely *not* dependent on external finance since their cash flow is enough to cover investment. This is coherent with the rise of corporate net lending which reflects the fact that internal liquidity of the corporate sector (savings) are sufficient to cover capital expenditure. Moreover, the average of the new estimations of the EFD index shows a decreasing trend, which is also consistent with the rise of net lending documented above. What is more, the decreasing trend in the average values of the index contrasts with the assumption of stability of the index over time. This is further supported by the analysis presented in Section 6.2.2. The degree of correlation between industry EFD values of subsequent

periods is poor or non-significant in most of the cases. Only the US and the UK show a significant degree of correlation (although the coefficients of correlation and R-squared are usually far from the unity), in line with the assumption of stability of the index within the same country. Despite these cases, our analysis reveals that, as general rule, it is not possible to claim that within the same country the degree of EFD does not change over time.

Furthermore, the assumption of invariability of the index across countries finds only limited or no support in the empirical tests. The values of the EFD index obtained for American firms do not seem to be a valid proxy for the EFD in other G7 countries. Only in a minority of cases the relationship between cross-country values of the EFD index is statistically significant. In addition, the correlations tend to become insignificant in more recent periods, compared to the 1980s and 1990s. Hence, it is possible to affirm that the idea that "technological differences persist across countries, so that we can use an industry's dependence on external funds as identified in the United States as a measure of its dependence in other countries" (Rajan and Zingales, 1998, p. 563) proves not to be empirically verified across G7 countries.

In light of this evidence it is necessary to reconsider the potential use of the EFD index. It should be concluded that it is still possible to consider the EFD index, as originally intended by the authors, as a measure that captures the "amount of desired investment that cannot be financed through internal cash flows generated by the same business" (Rajan and Zingales, 1998, p. 564). It can be appreciated that this statement reflects closely the definition of net lending. However, it has been demonstrated that, like net lending, the EFD index is a measure that can fluctuate over time and that, for the reason discussed here, it cannot be assumed that it uniquely "reflects technological characteristics of the industry" (Rajan and Zingales, 1998, p. 563).

These findings should be considered carefully by the abundant literature that employs the EFD index. Although the EFD can still be viewed as a measure that grasps the necessity of firms to rely on external funds, what emerges from this research is that, within listed NFC, industries, to a great extent, do not virtually depend on external funds to cover their investment. Since the EFD index is a proxy of net lending, the discussion on the causes of the emergence of net lending becomes relevant for the determination of the EFD too. Given that the assumptions of stability of the index have proven to be weak, the existing empirical studies that rely on the values of the

EFD index estimated by Rajan and Zingales (1998) may suffer from the fact that those values may not be representative of the specific country and period analysed. More broadly, the literature on EFD should also reconsider the theoretical interpretation of the EFD, as it cannot be regarded to be an index that uniquely reflects technological features.

After assessing in detail the objectives of this research, it is worth addressing additional general aspects that derive from the above analysis. The rise of net lending has different implications for economic theory. The traditional view of the private sector as net demander of funds needs has been radically reverted in the last decades. This seems to have become a structural characteristic of the corporate sector in developed economies. As mentioned in Section 2.2, part of the non-mainstream literature has considered the importance of internal funds to finance its investment (e.g. Kalecki, 1954; Steindl, 1989; Toporowski, 2000, 2012; Levy-Orlik, 2010). The sustained rise in corporate net lending documented in this thesis deepens this mechanism, as the corporate sector becomes, on aggregate, not dependent on sources of external finance to cover physical investment. It goes without saying that this does not apply to all firms, as a great number of companies continue to be net borrowers.[48] These corporations continue to rely on external finance to cover their capital expenditure. However, what can be highlighted is that this pattern has changed considerably in the three decades under consideration. The rise of net lending indicates that the relationship between savings and investment is weaker than what it used to be. This misalignment between corporate savings and investment has points of contact with the literature that study the vanishing link between profits and investment (Mason, 2015; Durand and Gueuder, 2018).

The rise of corporate net lending also poses some policy issues as it implies that there is an outstanding amount of liquidity devoted to unproductive use. In times in which the academic and media discussion grows about the possibility of secular stagnation (e.g. Summers, 2015), the presence of huge amounts of liquidity that is not channelled into productive has important policy issues. Potentially, the presence of net lending indicates that there is space for increasing the retribution of labour. From a demand driven perspective (e.g. Serrano, 1995; Setterfield, 2002) this would help to increase effective demand, create new investment

[48] This also applies to unincorporated businesses that, as mentioned in Section 2.2, are included in the household sector in the system of national accounts.

opportunity and foster the level of activity. Despite the theoretical potential of this mechanism, we are aware that redistribution of income is subject to distributive struggle that cannot be merely determined by technical and theoretical arguments.

This research also contributes by shedding new light on the concept of EFD. It has been established that, according to the current formulation, EFD cannot be considered to be uniquely determined by structural technological features. EFD appears to be a multifaceted concept, in which different factors take part in its determination. Once established that the EFD index and net lending are analogous concepts, financialisation and income distribution (and potentially other factors, not explored in this dissertation, too) become relevant to the discussion on EFD. This increases the complexity of the concept and should lead to the need of a reconsideration of the measure (see Section 7.4 below).

7.3. Limitations of the research

Before concluding this dissertation, it is necessary to devote some space to the discussion of the limitations that emerge from the foregoing analysis. One limitation of the research is that it is based on a subsample (i.e. listed firms) of the total corporate sector. In absolute terms, the volume of net lending grasped by the sample of firms employed in this dissertation is quite sizeable (see Figure 4). This, however, does not allow a direct generalisation of our conclusions to the whole corporate sector, so that the statistical inference applies only to the behaviour of listed firms only.

Second, in the era of globalisation it is not always easy to identify a unique geographical location for listed NFC. This study grouped companies according to their main country of operation, as classified in the Worldscope database. However, listed corporations often operate in multiple markets, so that the association of the firm to a unique country may entail some degree of imprecision. Given the level of detail of the information collected in the Worldscope database, it is not possible to provide a more accurate classification of the countries of operations for such a big number of firms. Despite this limitation, we believe that country specific characteristics have been identified with some clarity, as the cases of Japan and Canada show.

Third, the availability of data may change substantially between variables. As it has been discussed in Section 3.3, this is particularly true for firm-level income distribution variables that are not always available in non-European countries. While functional income distribution variables have a high representativeness among European countries, the reader

should bear in mind that the results for non-European countries may be limited to a smaller sample of firms or that their representativeness may cover only a limited number of years.

7.4. Final remarks and further research

This research has investigated in detail the role played by financial payouts and income distribution in the rise of net lending and has discussed some of the implications for economic analysis that derive from the growth of net lending.

This, however, does not exhaust the space for further research on this topic. In addition to the factors considered in this study, other aspects may also play relevant role in the determination of the level of net lending. One aspect that emerges from this dissertation and may motivate future research is the role of market concentration and firm size. The existing studies on the market concentration and net lending (Saibene, 2018) have not found a significant link between the two variables. However, our research show that there are reasons to believe that firms' size and concentration may play a significant role in relation to net lending. This is suggested by the positive link between sales and net lending and the negative relationship between net lending and wage share. For this reason, it would be relevant to link these aspects with other contributions, such as, for example, the role played by the process of centralisation of production (Bellofiore and Halevi, 2012) and "super-star" firms (Autor, Katz and Dorn, 2017) in the rise of net lending. More generally, this discussion could be related with long standing discussion on the role of monopoly power (Sweezy and Baran, 1966) and market concentration and profit dynamics (Kalecki, 1954, 1968). Although this topic has been an emblematic research line for non-mainstream scholars, in recent years we are witnessing to a renewed interest in in the connection between market power and capital accumulation. For example, Gutierrez and Philippon (2017, 2018) investigate the role played by industry concentration and different economic variables such as profits and investment. In light of this literature, one possible way to assess these aspects is to narrow the focus of the research on specific big firms, instead of including all listed NFC as in this research.

Similarly, the process of automatization and offshoring of production (Milberg and Winkler, 2013) represent possible areas of inquiry, given the impact they have on the production process. For example, it can be hypothesised that the process of offshoring allows to accrue profits while acting negatively on the level of investment. This type of approach may require the use of additional dataset and methodology (e.g. Input-Output analysis) in order to be properly addressed, as balance sheet data proceeding from Worldscope database may not be enough to provide the necessary degree of detail.

The econometric results that evidenced a negative link between the country-level labour share (*LABSHARE*) and corporate net lending can be of interest to neo-Kaleckian scholars who study in the relationship between functional income distribution and economic performance (e.g. Blecker, 2016; Naastepad and Storm, 2006). The evidence presented in Chapter 5 indicates that a more polarised functional income distribution has a negative impact on the level of firms' net lending, providing some evidence in favour of the underconsumptionist hypothesis (similarly to Behringer and van Treeck, 2018).

The results spreading from the analysis of the concept of EFD can potentially impact the academic community in different ways. As mentioned above in this chapter, the literature that employs the EFD index should consider the empirical outcomes of this research that evidence the not validity of the assumptions of stability of the index. This means that the applications of American values of the EFD index may lead to a different outcome than what would be obtained using country-specific estimations. A pending task is to determine if the existing empirical studies that use the EFD index would obtain different empirical outcomes by employing new values of the EFD index.

Additional consequences derive from the theoretical underpinnings of the formulation of the index. Since the fact that industries are mostly not dependent on external finance contrasts with the objective that motivated the creation of the EFD index, i.e. measuring external dependence. The theoretical explanatory power of the index is very much affected by the findings of this research. A possible solution may be to develop a new indicator of EFD that looks at the role of firms that are dependent on external sources of finance (i.e. firms that are net borrowers) from those that are not. This procedure would help to develop a measure that that considers the specific reality of those firms that still rely on external finance to fund their capital expenditure.

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Appendix

Table 25. Availability of observations for the wage variable. Absolute numbers and as share of the net lending number of observations.

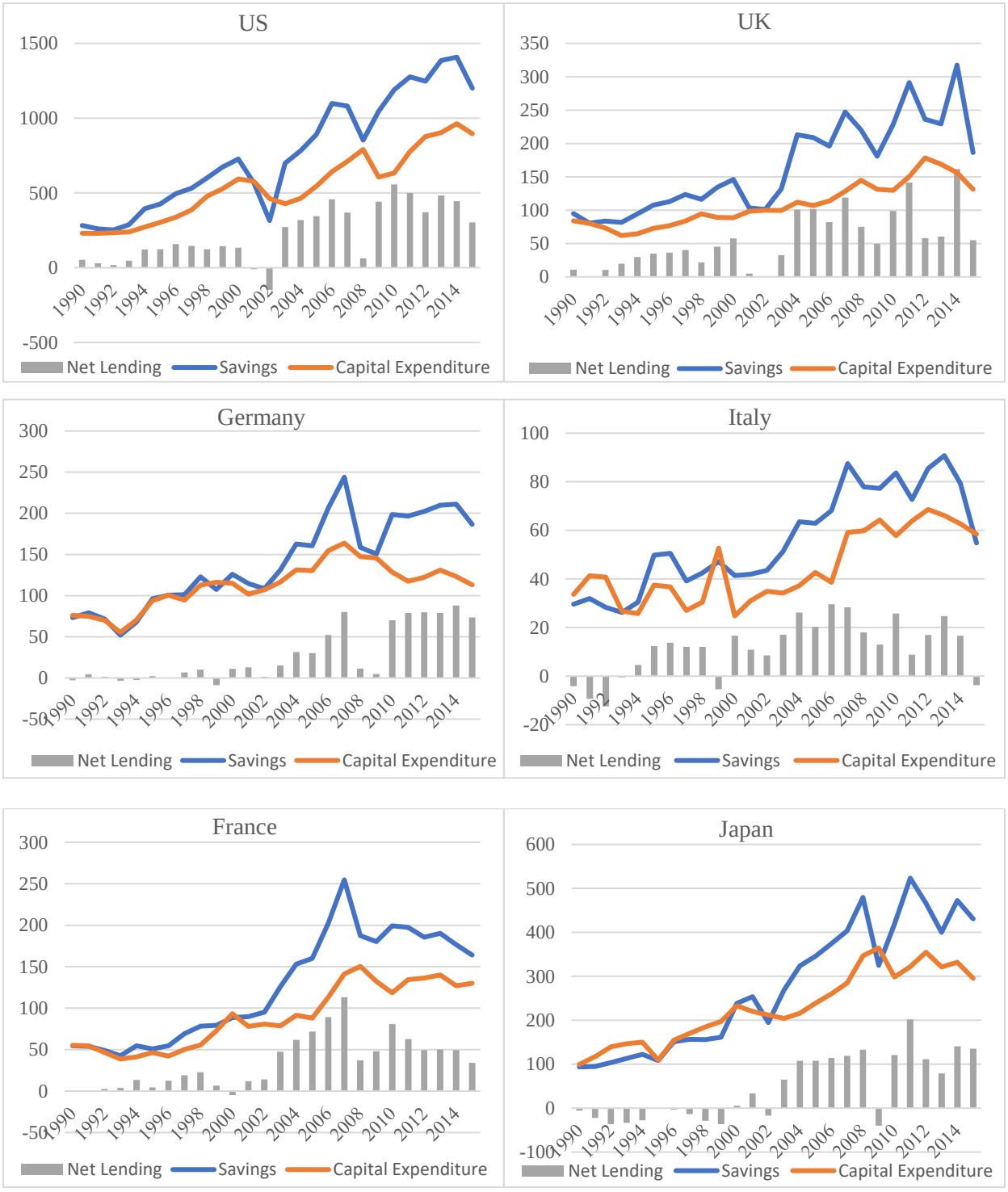
USA		UK		Germany		Italy		France		Japan		Canada	
N.	% NL	N.	% NL	N.	% NL	N.	% NL	N.	% NL	N.	% NL	N.	% NL
2	0.1	23	2.5	35	10.1	8	5.8	50	23.3	1	0.4	0	0
12	0.6	47	5.0	74	20.6	14	10.0	80	35.9	1	0.4	0	0
28	1.4	242	26.3	359	96.8	115	84.6	348	157.5	1	0.4	2	0.6
40	1.9	727	78.9	439	119.6	125	100	379	159.9	0	0	2	0.6
69	2.3	911	97.2	428	127.4	133	104.7	368	157.9	0	0	6	1.9
77	2.4	922	98.9	425	116.1	132	103.1	363	150.6	0	0	7	1.9
84	2.3	918	99.1	419	106.6	133	102.3	348	145.6	0	0	5	1.3
95	2.3	889	98.1	413	101.5	132	108.2	333	141.7	0	0	12	3.0
143	2.7	935	97.5	408	100.2	138	106.2	323	135.1	0	0	29	4.6
168	3.2	870	96.7	395	99.7	139	101.5	321	130.0	0	0	35	4.7
322	6.5	872	97.5	396	104.5	155	104.7	419	115.7	36	1.8	64	8.7
300	6.3	928	97.9	383	108.5	156	102.6	430	106.4	41	1.4	63	8.0
232	5.1	946	98.3	419	102.4	184	102.8	453	104.1	20	0.7	82	8.3
215	4.7	972	97.3	472	107.3	189	106.2	485	107.5	11	0.4	114	10.1
326	7.1	1019	97.2	496	107.6	208	110.1	478	111.4	13	0.4	138	11.3
402	8.5	1056	96.6	494	105.8	207	106.7	482	108.6	15	0.5	637	31.2
360	7.5	1084	96.8	496	105.3	207	103.5	469	108.3	13	0.4	772	36.0
389	8.3	1054	96.2	498	104.8	205	102.5	461	109.0	8	0.3	914	39.4
427	9.5	983	96.4	484	105.4	200	101.0	462	113.2	7	0.2	1047	44.0
435	10.1	908	95.5	469	106.3	193	99.0	440	112.2	32	1.1	1071	45.2
450	10.7	846	93.5	453	106.3	191	99.5	431	112.8	36	1.3	1159	47.9
422	10.3	836	92.2	436	106.3	190	101.1	430	113.2	51	1.9	1293	53.6
489	12.7	755	86.4	382	98.7	190	102.2	395	107.9	284	10.4	1288	56.2
456	12.7	629	75.4	346	92.8	185	97.4	377	104.7	2575	95.5	1019	52.9
437	13.0	651	83.0	348	98.6	181	98.9	387	107.5	2652	98.7	804	51.5
396	12.6	583	78.8	326	97.6	176	98.9	363	106.1	2652	98.4	713	52.3

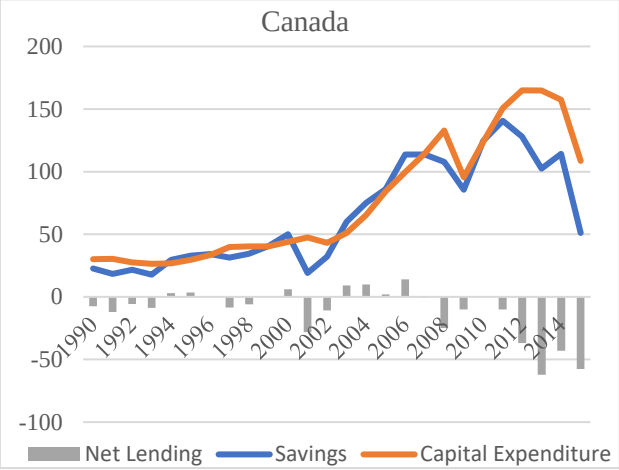
Source: Author’s calculations based on Worldscope data

Table 26. Variables definitions and Worldscope codes.

Symbol	Definition	Worldscope code
NET LENDING	Corporate savings minus addition to fixed assets	$\frac{(WC01651 + WC01151 - WC04601)}{WC02999}$
CURRLIAB	Current liabilities over total assets	$\frac{WC03351}{WC02999}$
LEVERAGE	Total Liabilities over total assets	$\frac{WC03101}{WC02999}$
SALES	Net sales over total assets	$\frac{WC01001}{WC02999}$
R&D	Research and Development expenditure over total assets	$\frac{WC01201}{WC02999}$
TOBINQ	Tobin's Q: (Market share price * common share outstanding + total liabilities) over total assets	$\frac{(WC08001 + WC03351)}{WC02999}$
LIQNEEDS	Inventories over total assets	$\frac{WC02101}{WC01001}$
PAYOUTS	Dividends plus share repurchases over total assets	$\frac{(WC04551 + WC04751)}{WC02999}$
DIVIDENDS	Dividends over total assets	$\frac{WC04551}{WC02999}$
BUYBACKS	Share repurchases over total assets	$\frac{WC04751}{WC02999}$
W_TA	Wages over total assets	$\frac{WC01084}{WC02999}$
W_SALES	Wages over net sales	$\frac{WC01084}{WC01001}$
W_VA	Wages over values added	$\frac{WC01084}{(WC01001 - WC01051 + WC04826)}$

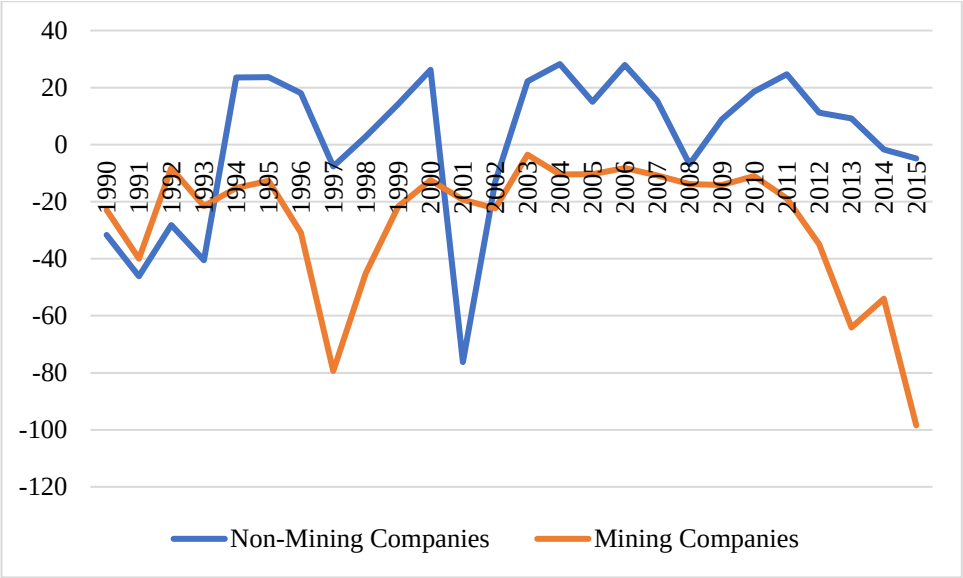
Figure 16. Total corporate savings, investment and net lending by country (Billions of US$).





Source: Author's calculations based on Worldscope database.

Figure 17. Average Net Lending/Net borrowing in Canada: Mining vs. Non-Mining companies. Millions of US$.



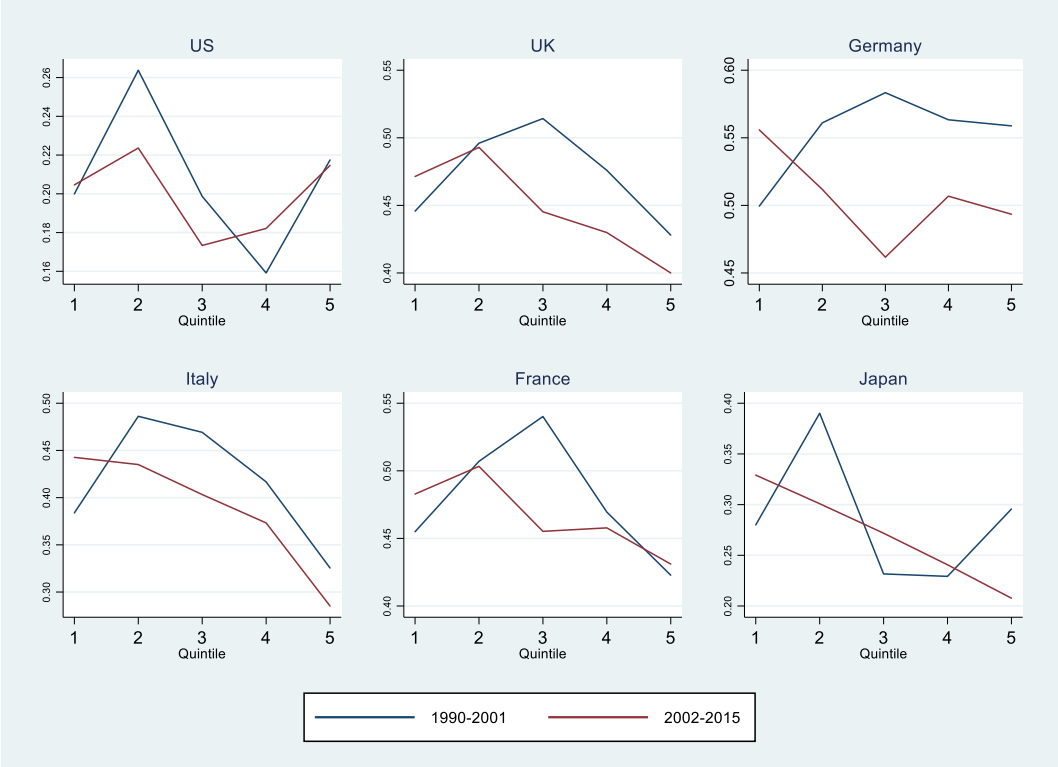
Source: Author's calculations with Worldscope data.

Table 27. Average ratio of net lending over total assets (%) by industry and sub-period (1990-2001 and 2002-2015). Full sample.

Industry	1990-2001	2002-2015
Primary	-0.01	-0.06
Mining	-0.15	-0.29
Construction	0.00	-0.02
Manufacturing	-0.04	-0.07
Utilities and transportation	-0.05	-0.05
Wholesale and retail trade	-0.03	-0.02

Source: Author's calculations with Worldscope data.

Figure 18. Average wages over value added ratio (%) by quintile of net lending/net borrowing and sub-period.



Note: Canada is not reported due to lack of data.
Source: Author's calculations with Worldscope data.

Table 28. Regressions results with *NL_TA_2* as dependent variable. Estimation period 1990-2015.

	(1)	(2)	(3)	(4)	(5)
CURRLIAB	-0.123***	-0.0912***	-0.0901***	-0.0837***	-0.130***
	(0.00897)	(0.0129)	(0.0120)	(0.0244)	(0.00875)
LEVERAGE	-0.146***	-0.128***	-0.140***	-0.153***	-0.140***
	(0.00647)	(0.0115)	(0.0111)	(0.0226)	(0.00621)
SALES	0.0530***	0.113***	0.0200***	0.0349***	0.0516***
	(0.00274)	(0.00725)	(0.00483)	(0.0103)	(0.00264)
TOBIN_Q	-0.00193**	-0.00235	0.000777	0.00180	-0.00123*
	(0.000790)	(0.00187)	(0.00149)	(0.00270)	(0.000739)
R&D	-0.608***	-0.273***	-0.320***	-0.522**	-0.595***
	(0.0557)	(0.0689)	(0.0700)	(0.228)	(0.0553)
LIQNEEDS	-0.0278*	-0.0284	-0.0310	-0.0179	-0.0396***
	(0.0147)	(0.0239)	(0.0229)	(0.0434)	(0.0141)
BUYBACKS	0.395***				
	(0.0789)				
W_TA		-0.422***			
		(0.0269)			
W_SALES			-0.384***		
			(0.0226)		
W_VA				-0.0853***	
				(0.0182)	
LABSHARE					-0.00220***
					(0.000267)
Constant	0.0185***	0.0185	0.129***	0.141***	0.162***
	(0.00550)	(0.0148)	(0.0159)	(0.0258)	(0.0157)
Observations	120,567	36,641	36,747	12,803	128,923
R-squared	0.067	0.099	0.114	0.077	0.061
Areg-R-Squared	0.606	0.660	0.621	0.722	0.602
N. of Firms	15,237	6,414	6,181	3,539	15,311
Time effects	Yes	Yes	Yes	Yes	Yes

NL_TA_2 = $Net\ Income + D\&A - Dividends - Capital\ Expenditure$.
Fixed-effects estimation. Robust corrected standard errors in parentheses. Coefficients for the year dummies not reported. ***** significant at 10%; ****** significant at 5%; ******* significant at 1%.

Table 29. Regressions results with *NL_TA_3* as dependent variable. Estimation period 1990-2015.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CURRLIAB	-0.187***	-0.190***	-0.185***	-0.101***	-0.100***	-0.105***	-0.192***
	(0.0106)	(0.0107)	(0.0105)	(0.0146)	(0.0138)	(0.0265)	(0.0103)
LEVERAGE	-0.160***	-0.160***	-0.162***	-0.139***	-0.160***	-0.165***	-0.157***
	(0.00787)	(0.00786)	(0.00781)	(0.0130)	(0.0127)	(0.0247)	(0.00741)
SALES	0.0537***	0.0537***	0.0536***	0.133***	0.0124**	0.0273**	0.0519***
	(0.00336)	(0.00340)	(0.00337)	(0.00818)	(0.00541)	(0.0119)	(0.00322)
TOBIN_Q	-0.00219***	-0.00225***	-0.00192**	-0.00367*	-0.000358	0.00130	-0.00113
	(0.000822)	(0.000814)	(0.000826)	(0.00189)	(0.00111)	(0.00237)	(0.000764)
LIQNEEDS	-0.0707***	-0.0727***	-0.0713***	-0.0413	-0.0468*	-0.0600	-0.0831***
	(0.0190)	(0.0190)	(0.0191)	(0.0282)	(0.0272)	(0.0512)	(0.0185)
PAYOUTS	0.289***						
	(0.0405)						
DIVIDENDS		0.269***					
		(0.0746)					
BUYBACKS			0.536***				
			(0.0914)				
W_TA				-0.539***			
				(0.0318)			
W_SALES					-0.448***		
					(0.0252)		
W_VA						-0.0880***	
						(0.0191)	
LABSHARE							-0.00135***
							(0.000347)
Constant	0.0146**	0.0128*	0.0193***	0.0260*	0.169***	0.159***	0.107***
	(0.00663)	(0.00678)	(0.00654)	(0.0154)	(0.0168)	(0.0281)	(0.0202)
Observations	126,554	126,385	124,989	36,276	36,251	12,688	133,673
R-squared	0.069	0.068	0.068	0.114	0.131	0.082	0.062
Areg-R-Squared	0.685	0.684	0.685	0.722	0.677	0.766	0.681
N. of Firms	15,533	15,398	15,586	6,466	6,209	3,556	15,658
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

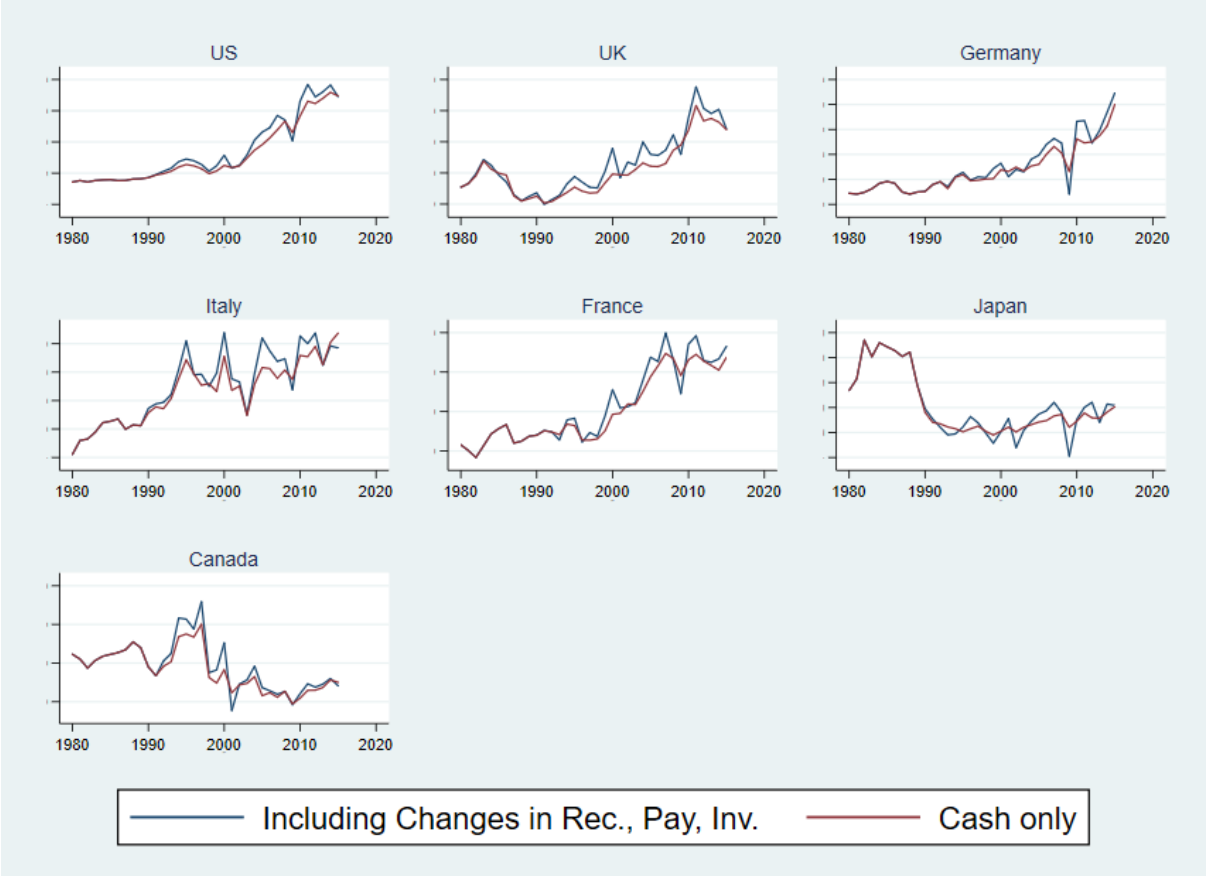
$NL\_3 = Net\ Income + D\&A - (Capital\ Expenditure + R\&D)$.
Fixed-effects estimation. Robust corrected standard errors in parentheses. Coefficients for the year dummies not reported. ***** significant at 10%; ****** significant at 5%; ******* significant at 1%.

Table 30. Estimations controlling for the Mining industry. Canada only. Estimation period: 1990-2015.

	(1)	(2)	(3)	(4)	(5)	(6)
CURRLIAB	-0.186***	-0.191***	-0.201***	-0.153*	-0.130	-0.197***
	(0.0308)	(0.0315)	(0.0302)	(0.0894)	(0.0887)	(0.0296)
LEVERAGE	-0.120***	-0.120***	-0.119***	0.00218	-0.0997	-0.120***
	(0.0213)	(0.0218)	(0.0210)	(0.0612)	(0.0752)	(0.0205)
SALES	0.0770***	0.0791***	0.0740***	0.0718*	-0.0449	0.0755***
	(0.0106)	(0.0110)	(0.0103)	(0.0426)	(0.0512)	(0.00984)
TOBIN_Q	-0.0106***	-0.0109***	-0.00862***	1.99e-05	-0.0147	-0.00904***
	(0.00364)	(0.00367)	(0.00318)	(0.00555)	(0.0110)	(0.00339)
R&D	-0.900***	-0.899***	-0.920***	-1.294***	-1.085**	-0.902***
	(0.201)	(0.201)	(0.203)	(0.373)	(0.457)	(0.201)
LIQNEEDS	-0.0242	-0.0294	-0.0251	-0.348	-0.320	-0.0309
	(0.0482)	(0.0488)	(0.0486)	(0.237)	(0.284)	(0.0477)
PAYOUTS	0.345***					
	(0.121)					
*DUM*PAY*	0.804**					
	(0.331)					
DIVIDENDS		0.390				
		(0.267)				
*DUM*DIV*		0.610				
		(0.684)				
BUYBACKS			0.297			
			(0.253)			
*DUM*BUY*			0.195			
			(0.851)			
W_TA				-1.059***		
				(0.211)		
DUM W_TA*				0.241		
				(0.386)		
W_SALES					-0.728***	
					(0.139)	
DUM W_SALES*					0.522***	
					(0.165)	
LABSHARE						-0.0147***
						(0.00524)
DUM LABSHARE*						0.00546***
						(0.00165)
Constant	-0.0956***	-0.0961***	-0.0857***	-0.109	0.00749	0.659**
	(0.0173)	(0.0180)	(0.0170)	(0.0740)	(0.0931)	(0.303)
Observations	11,164	10,850	11,488	1,553	1,408	11,906
R-squared	0.069	0.068	0.066	0.107	0.129	0.074
Areg-R-Squared	0.615	0.615	0.610	0.766	0.731	0.614
N. of Firms	1,775	1,739	1,788	609	540	1,792
Time effects	Yes	Yes	Yes	Yes	Yes	Yes

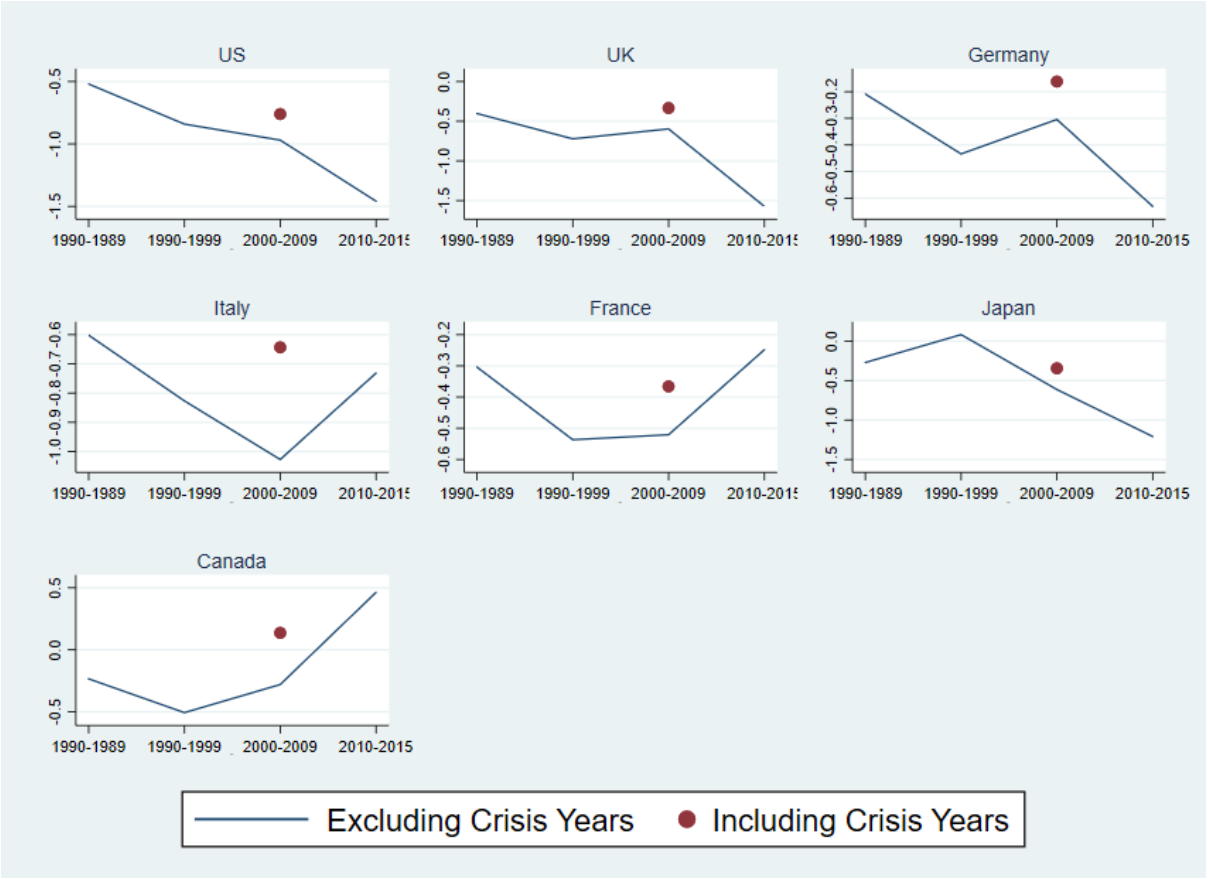
Fixed-effect estimation. Robust corrected standard errors in parentheses. Coefficients for the year dummies not reported. ***** significant at 10%; ****** significant at 5%; ******* significant at 1%.

Figure 19. Cash flow including and omitting changes in Receivables, Payables and Inventories. Average values by firm.



Source: Author's calculations using Worldscope data.

Figure 20. Evolution of the industry average values of the EFD index excluding crisis years (2008-2009) and including them.



Source: Author's calculation using Worldscope data.